STRATEGIES FOR COMPETITIVE ADVANTAGE AND SUPPLY CHAIN MANAGEMENT: SYNERGY OPPORTUNITIES

A Dissertation

by

SAEED ABDULLA ABDULWAHID ABDULLA

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2009

Major Subject: Information and Operations Management

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Approved by:

Co-Chairs of Committee,	Antonio Arreola-Risa
	Mike Hitt
Committee Members,	Benito Flores
	Dudley Poston, Jr.
Head of Department,	Powell Robinson, Jr.

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ABSTRACT

Strategies for Competitive Advantage and Supply Chain Management: Synergy Opportunities. (August 2009)

Saeed Abdulla Abdulwahid Abdulla, B.S., University of Toledo;

M.S., University of Miami

Co-Chairs of Advisory Committee: Dr. Antonio Arreola-Risa
Dr. Mike Hitt

Integrating research from the strategic management and the supply chain management (SCM) literatures promises a fertile area of research that can enrich both areas. In this work, an attempt was made to answer the recent calls for incorporating perspectives from each field into the other. These calls were further encouraged by the new competitive landscape characterized by hypercompetition and network versus network competition. Thus, the field of Strategy, with its emphasis on gaining and sustaining competitive advantage, and SCM, with its emphasis on managing processes spanning organizational boundaries, stand to benefit greatly by this integration. The introduction chapter briefly describes what this research tried to achieve. In the supply chain management literature review chapter, the importance of managing supply chains in this era of network versus network competition is shown and the strategic demand network management (SDNM) concept is presented as an evolution of supply chain management and as a more suitable name reflecting the processes involved. In the third chapter, a selected list of supply chain management practices is presented and explained.

The fourth, fifth and sixth chapters will endeavor to carry on three developments. These developments seek to integrate strategy and SCM research in three ways. In the first development, the dynamic capability perspective from the strategy field and the SDNM capability are integrated in order to suggest how demand network management enables dynamic capabilities. On the other hand, dynamic capabilities perspective were used to guide the SDNM practices. In the second development, alliance management capability from the strategy field was integrated with SDNM capability and SDNM practices to show how concepts from both areas can enrich the other. And finally the third development builds on the first two developments to explore how SDNM capability can facilitate strategic entrepreneurship (SE) and SE based boundary decisions.

DEDICATION

This dissertation is dedicated to:

My father and mother,

for all the love, trust, sacrifices, encouragement, prayers, and immeasurable support they have provided me, for which I'm forever indebted.

Uncles,

whose love, support, and sincere efforts made my quest for higher education possible;

My brothers and sisters,

for their encouragement, support and prayers;

My wife,

whose infinite love, constant encouragement, patience, and resilience made my Ph.D. studies possible;

My daughters,

who have put a permanent smile on my face and fill my life with extreme joy and pleasure;

My country, the United Arab Emirates,

that has provided me with an unmatchable scholarship from the moment I graduated from high school to this day and has sincerely cared for me.

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.

TABLE OF CONTENTS

Page

ABSTRACT iii

DEDICATION v

ACKNOWLEDGEMENTS vi

TABLE OF CONTENTS viii

LIST OF FIGURES xi

CHAPTER

I INTRODUCTION 1

II SUPPLY CHAIN MANAGEMENT LITERATURE REVIEW 5

2.1 The New Competitive Landscape 5
2.2 Supply Chain(s) 6
2.3 Importance of Supply Chain Integration 8
2.4 Integration and Management of Supply Chains 10
2.5 Supply Chain Management (SCM) Definition 16
2.6 Demand Chain (Network) Management 18
2.7 Strategic Supply Chain Management 20
2.8 Strategic Demand Network Management (SDNM) 20

III SDNM PRACTICES 22

3.1 SDNM Practices Review 22
3.2 SDNM Practices Subset 28
3.3 Strategic Demand Network Orientation (SDNO) 34

IV THE DYNAMIC CAPABILITIES AND SDNM 39

4.1 Dynamic Capabilities Literature Review 39
4.2 Dynamic Capabilities and Competitive Advantage 43
4.3 Dynamic Capabilities and SDNM 45
4.4 Dynamic Capabilities: Processes and Applications 50
4.5 SDNM Practices and Dynamic Capabilities 61

CHAPTER Page

4.6 Concluding Remarks 85

V ALLIANCE MANAGEMENT CAPABILITY AND SDNM 90

5.1 Strategic Alliances Literature Review 91
5.2 Strategic Alliances and Competitive Advantage 97
5.3 Alliance Management Capability Activities 104
5.4 Dedicated Alliance Management Function 118
5.5 Alliance Management Activities and SDNM Practices 122
5.6 SDNM Practices and Dedicated Alliance Management Function 151
5.7 Concluding Remarks 154

VI STRATEGIC ENTREPRENEURSHIP (SE), SDNM, AND ORGANIZATIONAL BOUNDARIES 160

6.1 Organizational Boundaries Literature Review 164
6.2 Organizational Boundaries and Competitive Advantage..... 180
6.3 SE Literature Review 186
6.4 Strategic Management of Resources 190
6.5 Strategic Management of Resources and SDNM 195
6.6 Entrepreneurship, Innovation and SDNM 216
6.7 SDNM and SE 228
6.8 SDNM, SE, and Organizational Boundaries 235
6.9 Concluding Remarks 243

VII CONCLUSION 253

7.1 Summary 253
7.2 Implications 263
7.3 Future Research 266

REFERENCES 268

VITA 308

LIST OF FIGURES

FIGURE Page

1 Dynamic Capabilities and the SDNM Capability 86

2 Alliance Management Capability and the SDNM Capability 159

CHAPTER I

INTRODUCTION

Recently, the strategic management literature has shown great interest in supply chain management as a potential means for attaining and sustaining competitive advantage. The Supply Chain Management (SCM) term's meaning and what it addresses I believe have also come closer to the "value chain" concept and hence has grown in scope to directly relate to organizational strategy. Supply chain management is no longer just about efficient flow of material, money and information, but instead about improving the performance of the entire value chain or network. Calls for research integrating organizational and strategy research with supply chain management research has been increasing (e.g., Ketchen and Hult, 2007a, b; Miles and Snow, 2007). Surely, incorporating perspectives from strategy research into SCM can guide SCM and elevate it to a more strategic level, while at the same time, strategy can benefit from SCM in implementing and enabling organizational strategies.

Although the notion of value chains proposed by Porter, 1985 does emphasize treating value adding processes strategically, SCM focuses on actually managing these processes and relationships extending across different interdependent yet vertically disintegrated organizations, along with managing the internal chains and processes. Thus, SCM can be the tool that manages the value chain while also benefit from the theoretical perspectives provided by different strategy and organizational theories.

This dissertation follows the style of *Academy of Management Journal*.

Therefore, transaction cost economics, agency theory, resource dependence theory, institutional theory, game theory, network theory, social capital theory, strategic choice, resource-based view (RBV), knowledge-based view (KBV), and dynamic capabilities literatures can greatly add to supply chain management literature (Cheng & Grimm, 2006; Grover & Malhotra, 2003; Ketchen & Giunipero, 2004; Ketchen & Hult, 2007b, 2007a). However, before proceeding with the integration, a literature review of SCM will be presented. In this literature review, the case for SCM's evolution from a logistics function to a broader Strategic Demand Network Management (SDNM) capability is made. Moreover, a set of SCM practices are presented and explained.

After that, three developments will be carried out in this research. The first development integrates the work on SCM with the dynamic capabilities framework of strategic management research. It will look at how SCM practices and concepts can play a role in achieving and obtaining dynamic capabilities. Moreover, it has been proposed in strategy research that dynamic capabilities are necessary but not sufficient to gain competitive advantage (Eisenhardt & Martin, 2000; Zahra, Sapienza, & Davidsson, 2006), and this work proposes that SCM practices are essential for developing dynamic capabilities in a network-based competition. If having dynamic capabilities are necessary to gain competitive advantage for firm level competition then certainly in an era where networks and chains compete against other networks and chains, a firm can not be dynamic and agile without having a dynamic and agile network and chain. This work will also use the dynamic capabilities strategy to guide the SCM practices' development and supply chain designs. By doing so, SCM could incorporate the

strategy's desire to develop dynamic capabilities and thus emphasize fostering agility and flexibility in the supply chains, which in turn can lead to more refined dynamic capabilities.

In the second development, an attempt will be made to integrate SCM with the relational view, network theory, and alliance research from the strategic management field. I believe the relational view and network theory can add to SCM practices' research because SCM practices involve interactions between interdependent yet independently owned network of firms, and interactions between the employees of the network firms. Many strategic demand chains depend on trusting supply chain partners and aligning incentives and objectives, even if in the short term some members may suffer losses for the sake of long-term supply chain success. Relational view and Network theory research results should add to the still developing SCM field and will surely enrich the SCM practitioners' and researchers' understanding of the relational interactions between supply chain partners and how to more effectively design and implement SCM practices. On the other hand, SCM can add to the relational view and the network research through its practices which address how firms in a network relate and connect strategically and operationally.

SCM uses the supply chain to enhance key outcomes that impact the firms' performances (Hult et al., 2004) and it incorporates the agility of the chain ("ability to be proactive and responsive"), the adaptability of the chain ("maintaining a limited set of multiple chains") and the alignment of the chain ("synergistic interests") for a total value across speed, quality, cost and flexibility competitive priorities (Lee, 2004). Building on

the Resource-Based View and the Knowledge-Based View of the firm, in the third development an attempt will be made to build on the previous two developments to present SCM capability as a facilitator of strategic entrepreneurship, and hence, as an enabler of more effective boundary decisions. Indeed, SCM practices enable both a total system view and an effective management of the relationships between the chain members. Consequently, SCM practices will enable better integration and outsourcing decisions, and at the same time, these practices will enable better decisions regarding which future core competencies the firm can and will be able to develop. Moreover, the strategic management's RBV, KBV, and the research on vertical integration can be used to guide the SCM practices and relationships.

Next is a literature review of the supply chain management field followed by a supply chain management practices chapter. In each of the developments to follow, arguments are made for a set of proposals on how the two fields relate. In addition, each of the research integration chapters will offer concluding remarks on respective developments.

CHAPTER II

SUPPLY CHAIN MANAGEMENT LITERATURE REVIEW

2.1 The New Competitive Landscape

In this era of fierce global competition, increasing outsourcing and continued disintegration of the traditional vertical firm, the supply chains and the networks made up of multiple firms, are becoming the units of competitive analysis (Chen & Paulraj, 2004; Dyer, Cho, & Chu, 1998; Ketchen & Hult, 2007b; McCarter & Northcraft, 2007; Miles & Snow, 2007). In many industries, end customers have become the most powerful members of the chain and no longer accept what is pushed through the chain if it does not meet their expectations and demands (Payne, Storbacka, & Frow, 2008; Prahalad & Ramaswamy, 2002, 2004a, 2004b). Current-day customers require more product and service variety, shorter lead times and lower prices in addition to higher quality and more customization.

Many firms realized that they can't be the best in all the processes required to meet such demand, and consequently they decided to focus on their core competencies. This in turn has led many firms to outsource none-core functions, leading to the creation of supply chains or networks of independent companies that need to synchronize their interdependent processes in order to efficiently satisfy the demands of the customers (Prahalad & Hamel, 1990; Skinner, 1974). Moreover, some firms source inputs and distribute outputs internally and externally at the same time in pursuit of "taper integration", i.e. outsourcing some core processes while keeping a duplicate in house in

order to lower transaction costs while simultaneously increasing flexibility (Rothaermel, Hitt, & Jobe, 2006). While it has been and still is hard for an integrated firm to coordinate its processes to meet customers' demands efficiently and effectively, it can be even harder for the group of independent firms making up the supply chain to work in an aligned way.

Hence, the supply chain's ability to meet end customers' demands in the most efficient and effective way has become a strategic capability that can lead to competitive advantage (Ireland & Webb, 2007b; Jones, 1998). No longer are firms independently competing against each other, but the network of interdependent firms that they belong to are competing against other networks (i.e. network versus network competition) (Christopher, 2005; Ketchen & Hult, 2007b; McCarter & Northcraft, 2007; Monczka & Morgan, 1997). Therefore the new challenge for attaining competitive advantage is effectively designing, managing and optimizing these supply chains or networks (Chen & Paulraj, 2004; Fine, 1998, 2000). Moreover, managing external supply chains requires and assumes that internal supply chains, all the processes within the firm, are also managed in an efficient and effective way so that they can be synchronized with the external processes (Takeishi, 2001). A more elaborate description of supply chains is presented next.

2.2 Supply Chain(s)

All the steps and processes involved in delivering the product or service to the end customer make up what is called a supply chain (Mabert & Venkataramanan, 1998). Defined in a more holistic fashion, the supply chain is "the network of facilities and

activities that perform the functions of product development, procurement of material from vendors, the movement of materials between facilities, the manufacturing of products, the distribution of goods to customers, and the after-market support for sustainment" (Mabert & Venkataramanan, 1998: 539). This definition is more in line with the "value chain" view which includes all the value-adding processes required to deliver the product or service to the end customer or market (Davis, 1993; Porter, 1985b). According to Martin Christopher, the term supply chain may have not initially meant value chain, but continued outsourcing and vertical disintegration has led the "value chains to be extended beyond the boundaries of the firm and hence the supply chain is becoming the value chain" (2005: 15).

The concept of supply chain was developed in parallel across several fields. The Logistics, Marketing, Operations, Information Technology, Systems, Organization, and Strategy researchers have all contributed to the development of the supply chain concept and the supply chain management field (Otto & Kotzab, 2003). Initially, supply chains may have focused on efficiency but that focus has evolved over the years to agility, adaptability and alignment of the supply chain (Lee, 2004). Different products and services require different supply chain designs, configurations and practices (Fisher, 1997).

In fact, some supply chain designs and configurations enable cost leadership and others enable differentiation and flexibility (Fine, 2000). And no supply chain design or management principle is applicable universally to every product or service in every market. Instead, each supply chain should be designed, configured, developed and

managed according to the competitive requirements of the product or service in question (Chesbrough & Teece, 1996; Fine, 1998, 2000; Fisher, 1997). Nonetheless, processes that extend across different firms making up the supply chain need to be integrated and the next section addresses the importance of supply chain integration.

2.3 Importance of Supply Chain Integration

Integrating across the different functional units of the firm is a necessary step toward the competitive advantage of the firm. This might have been sufficient in the past but no longer enough in today's competitive environment. Joint collaboration, coordination, integration and decision making between different functional units within the same organization was required to lower costs, reduce lead times, and differentiate from competitors. However, according to Chesbrough and Teece "today, few companies can afford to develop internally all the technologies that might provide an advantage in the future" (1996: 72). The notions of trade-offs and focus on core competencies has led many firms to focus on what they believe are their core functions and processes. They hope to become the best at what they do and work with suppliers who are the best in the market, in order to provide the maximum value for the customer (Corbett & Wassenhove, 1993; Skinner, 1974).

This trend has led to the creation of long-term relationships with strategic suppliers and customers. Thus, no longer is the competitive advantage of a firm dependent on its resources and capabilities solely. Instead, the firm's competitive advantage depends on how the firm efficiently and effectively identifies, integrates, manipulates and deploys unique combinations of the resources and capabilities available

internally and throughout the network it belongs to in order to create core competencies capable of attaining and sustaining competitive advantage.

Therefore, the firm's relationship with its suppliers and customers has become an important part of the business management process. The links between the different companies in the chain can't be looked at as simple purchasing or marketing functions, but instead each interface function or linkage, such as marketing, purchasing, and/or logistics, should be looked at strategically within the supply chain management context (Carr & Smeltzer, 1999; Cooper & Ellram, 1993) as a resource (Rungtusanatham et al., 2003). These linkage functions are strategic resources in themselves and should be developed, managed and protected in order to gain and sustain competitive advantage (Rungtusanatham et al., 2003). In fact, Kale, Dyer and Singh (2002) have shown that alliances that create an alliance management function to coordinate between the alliance partners and capture valuable knowledge achieve greater success than alliances that do not create such functions.

According to the RBV, a firm's rare, valuable, imperfectly imitable, and not substitutable (VRIN) bundle of resources and its capability to optimally configure and deploy these resources plays a significant role in the firm's ability to attain and sustain competitive advantage (Barney, 1991; Penrose, 1959; Peteraf, 1993; Wernerfelt, 1984). Resources include all the physical assets, the tangible and intangible assets, the routines, the procedures, the knowledge, the reputation, the human capital, the know-how, etc., that the firm owns or can access, can configure, and can deploy and use to implement its competitive strategies. Moreover, the capability to combine, deploy and manage the

resources in an effective way can be a source of competitive advantage as well (Barney, 1991; Penrose, 1959; Peteraf, 1993; Wernerfelt, 1984).

In addition, understanding the relationship between the resources and the capabilities on one hand and competitive advantage and profitability on the other hand is an important part of the firm's competitive strategy according to the RBV (Grant, 1991). To have the ability to incorporate customer desires and to integrate and manage heterogeneous resources from different supply chain members to meet the customer demand in the most efficient and effective way is the objective of the supply chain management construct. This capability to exploit the resources available in the supply chain is only possible if the linkages between the supply chain members are considered resources themselves and exploited accordingly. Supply chain linkages connect the different entities in the supply chain and enable the coordination and management of the flow of material, information and funds between and among the chain members. These linkages are access mechanisms to valuable resources, which exist in the supply chain, that firms, individually and/or collectively, can identify, integrate, reconfigure, combine and deploy in a synergistic way that can create and sustain competitive advantage (Rungtusanatham et al., 2003).

2.4 Integration and Management of the Supply Chains

Therefore, the capability to manage the supply chain becomes a critical capability (Christopher, 1992; Ireland, Hitt, & Vaidyanath, 2002; Kale, Dyer, & Singh, 2002; Li et al., 2006b; Porter, 1985b; Spekman, Kamauff, & Myhr, 1998a; Vokurka, Zank, & Lund, 2002). As it is important to integrate the different functional units in the

vertical firm, so is the managing and virtually and/or physically integrating the different interdependent firms involved in delivering the product or service to the market. Although integration is not a given in a vertical firm (Bozarth, Handfield, & Das, 1998), the management has the authority to force the different internal units of the internal supply chain to conform to company objectives via an authoritative decree (fiat). This integration of different interdependent units within the same firm is necessary for the firm to be able to compete and succeed (Boyer & Hult, 2005). Nonetheless, managing the external supply chain is no less important than managing the internal supply chain. Verily, the task of aligning incentives and objectives along the supply chain and managing the supply chain itself is far more difficult when the chain is made up of independent firms, each with its own objective, cost structure, and culture (Hammer, 2001).

Lack of trust , misalignment of incentives (Narayanan & Raman, 2004), fear of opportunism, or of hold up (Dyer & Nobeoka, 2000; Williamson, 1975, 1985) and fear of being locked-in with a low-quality supplier, “inter-firm rivalry” (Park & Ungson, 2001) and other such obstacles make the coordination of two independent firms more challenging and may even lead to supply chain failure. Therefore, active management of the supply chain is needed to effectively exploit the supply chain resources. In fact, supply chain management has become an important and effective means for lowering costs, improving customer service, meeting customer demand, and obtaining competitive advantage (Croxton et al., 2002; Green, McGaughey, & Casey, 2006; Lee & Whang, 2001; Li et al., 2006a; Olavarrieta & Ellinger, 1997; Tan, Lyman, & Wisner, 2002).

The integration, collaboration, coordination, and synchronization of the supply chain is critical for creating an agile and responsive supply chain (Christopher, 2005). Customers demand shorter lead times and higher product availability, while at the same time they require lower prices. For example, in order for firms to be able to improve their customer service, firms can hold more inventories but that will increase their costs and their vulnerability to obsolescence, especially for high technology products known for their short life cycles. This problem is magnified in vertically disintegrated supply chains made up of interdependent yet independently owned firms. Each firm may seek its own customer service levels, which may not consider end customers, and hence its accompanying inventory levels that maybe optimal for the firm but lead to suboptimal service levels or higher costs for the entire chain and consequently for the end customer (Narayanan & Raman, 2004). Therefore, improving the service level provided to the end customer's and lowering the costs naturally require the integration of the supply chain and hence the joint management of inventories, product development projects, and other related activities and costs.

The supply chain literature is abundant with research that points out to the importance of integrated supply chains and how beneficial integration is for improving customer service and lowering total system costs. Verily, integrated and coordinated supply chain management can improve customer service (Boyaci & Gallego, 2004) and even indirectly lead to better financial performance (Vickery et al., 2003). This is achieved through the advances in information technology which have made possible the visibility of end customers' demand, inventory levels throughout the supply chain,

supply capacities, and delivery schedules across the different stages in the supply chains. Thus, information sharing holds great potential for improving supply chain operations if this visibility is used for integration and coordination purposes (Lee, 2000; Lee, So, & Tang, 2000; Sahin & Robinson, 2002). However, sharing information does not automatically lead to better supply chain performance, but coordinated decision making based on the shared information can (Sahin & Robinson, 2002; Sahin & Robinson, 2005). Integration of supply chains has the potential to improve and create operational capabilities that differentiate the firm in terms of cost leadership, product and service quality, customization, lead times, flexibility and agility and other competitive strategies (Rosenzweig, Roth, & Dean, 2003).

Supply chain integration is also necessary for creating flexibility and agility in the supply chain (Christopher & Towill, 2001) because integrating product development plans and product designs with the suppliers lead to reduced investments and shorter cycle times (Morgan & Monczka, 1996; Ragatz, Handfield, & Petersen, 2002; Ragatz, Handfield, & Scannell, 1997). Integrating with customers gives supply chain members the knowledge of the true end demand and hence enables a more accurate forecasting and planning of responses to meet the demand (Croson & Donohue, 2003; Lee et al., 2000). However, this integration must be followed by coordination, collaboration, and alignment of the objectives along the supply chain for the supply chain to be able to reap the benefits of integration and obtain competitive advantage against other supply chains (Lee, 2000; Lee, 2004; Narayanan & Raman, 2004).

The integration and management of the supply chains has the potential to lead to better performance in terms of costs, and differentiation, especially in manufacturing where large investments in assets and inventory are required (Frohlich & Westbrook, 2001). In fact, to manage and integrate with the different chain members, firms are increasingly seeking supply chain integrators who can work with different suppliers and customers in order to integrate and coordinate the interdependent supply chain activities and processes, which results in lower costs and increased customer service (Parker & Anderson, 2002).

Furthermore, supply chain integration is facilitated by advances in information technologies, and inter-firms linkages and its importance is further enhanced by the increasing global competition. An integrated supply chain requires managing the inventory flows, the information flows, the financial flows, and the supply chain relationships (Handfield & Nichols, 1999). Moreover, supply chain integration requires that the supply chain members cooperate, collaborate, share information, trust one another, form long-term partnerships, share technology and focus on managing integrated business process that extend across the supply chain partnerships and linkages (Akkermans, Bogerd, & Voss, 1999). Although this holistic view promoted by supply chain integration holds much potential for securing competitive advantage, and as intuitive as it may sound, integration across a complex supply chain and network in a timely manner does not naturally occur and is difficult to achieve (Lee, 2000; Power, 2005). Instead, it has to be developed, implemented and managed cautiously and diligently.

Moreover, managing the supply chain has become a critical capability for staying competitive (Power, Sohal, & Rahman, 2001; Tan et al., 2002). The concept of supply chain management has been covered extensively in the academic literature but a consensus on its definition is yet to form. Because supply chain management involves managing processes across many different functional areas in an organization and across different organizations, it is natural that it has received attention from different academic disciplines, which has contributed to the development of the supply chain management field (Ketchen & Giunipero, 2004).

While different fields take credit for inventing the term supply chain management, the logistics field may very well be the first to have used the term 'supply chain management' (Houlihan, 1985, 1988). It was considered by logistics practitioners and academics as an extension of logistics outside the firm to include suppliers and customer (Handfield & Nichols, 1999; Simchi-Levi, Philip Kaminsky, & Simchi-Levi, 2000). Nonetheless, in 1998, the Council of Logistics Management noted that logistics is only a part of supply chain management, and that supply chain management is broader in scope because it takes into account the effect of more than just the logistics function, on processes that span across the supply chain member firms (Lambert & Pohlen, 2001).

The scope of SCM was initially narrowed to purchasing and logistics relationships, and indeed the purchasing and logistics functions are critical parts of the SCM concept (Carr & Smeltzer, 1999; Christopher, 1992; Cooper & Ellram, 1993; Monczka & Morgan, 1997; Morgan & Monczka, 1996). However, the term supply chain management has broadened in meaning (Chopra & Meindl, 2004), to the extent

that it is seen as a critical part of competitive strategy (Li et al., 2006a) and can be a core competency (Tummala, Phillips, & Johnson, 2006). Effective and efficient supply chain management can indeed lead to improved product and service quality, increased product and service value, while at the same time lower total system costs (Davis, 1993). Therefore, supply chain management strategies can clearly support the organization's competitive strategy (Ketchen & Hult, 2007a; Wisner, 2003). Next a definition of SCM that will be used throughout this work is presented.

2.5 Supply Chain Management (SCM) Definition

Although many definitions exist for SCM in the literature (Bechtel & Jayaram, 1997; Chandra & Kumar, 2000; Chen & Paulraj, 2004; Chopra & Meindl, 2004; Cooper, Lambert, & Pagh, 1997a; Croxton et al., 2001; Croxton et al., 2002; Kannan & Tan, 2005; Ketchen & Giunipero, 2004; Lambert & Cooper, 2000; Lambert, Cooper, & Pagh, 1998; Li et al., 2006a; Lummus & Vokurka, 1999b; Mentzer et al., 2001; Scott & Westbrook, 1991; Storey et al., 2006; Tan, 2001; Thomas & Griffin, 1996; Vakharia, 2002; Vickery et al., 2003; Wisner, 2003), they all promote a holistic system-wide view, integration, coordination to synchronize capabilities, and focus on end customers' value (Mentzer et al., 2001). Moreover, they all present SCM as a means for creating synergy between vertically related partners (Lambert & Cooper, 2000).

Even though supply chain management may initially have only been concerned with the logistics of materials' efficient movement (Cooper & Ellram, 1993), it has broadened in scope to the extent that is becoming synonymous to "value chain" and "value system" concepts (Christopher, 2005; Porter, 1985b). Most definitions of SCM

are very similar in what they posit SCM should do. All definitions promote the holistic system approach and allude to the supply chain management's significance for supporting the firm's strategy in order to attain and sustain competitive advantage.

The Council of Supply Chain Management Professionals (CSCMP), formerly the Council of Logistics Management, provides what I believe is a well articulated and a very precise definition of supply chain management on their website (http://cscmp.org/). They state that supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies (CSCMP, 2009), underline added for emphasis.

Moreover the CSCMP states that supply chain management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the logistics management activities noted above, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance, and information technology (CSCMP, 2009).

2.6 Demand Chain (Network) Management

Because supply chain management addresses all the steps and processes necessary to meet the end customer's requirements in the most efficient and effective way, some suggest using the term demand chain management instead because they believe that all chain activities should be based on the end customer's demand (Christopher, 2005; Frohlich & Westbrook, 2001, 2002; Vollmann, Cordon, & Heikkila, 2000). The logic is that chains should be designed starting with the objective of best meeting the end customer's demand and then designing, managing and coordinating the supply chain activities to best meet that demand (Frohlich & Westbrook, 2002). Depending on the given circumstances, to be able to compete more effectively for the more demanding current-day customers, the chain should, sometimes, be designed as a pull system rather than as a traditional push system (Lummus & Vokurka, 1999a). Hence, a pure push system is no longer effective in modern demand chains where different autonomous members need to coordinate their production decisions and nor will a pure pull system provide the optimal alternative.

In fact, depending on the product's characteristics, a combination of push and pull systems where the goal is to optimally decide the resource allocation among the demand network members is the best alternative (Bitran, Gurumurthi, & Sam, 2007), which is especially true for manufacturing firms (Frohlich & Westbrook, 2002). This could explain the recent expansion in the number of firms that are using postponement as an alternative that combines both efficiency and flexibility objectives (Billington & Amaral, 1999; Edward & Lee, 1997; Feitzinger & Lee, 1997; Hoek, 2001; Van Hoek,

1998). Under postponement, inventory is held in generic form until a customer order is realized and the generic inputs are assembled into a final customized product.

Nonetheless, the SCM philosophy encompasses the demand management process, which incorporates the end customer's anticipated and actual demand in designing, developing, integrating and coordinating activities and capabilities across the supply chain to effectively and efficiently meet the customer's demand (Croxton et al., 2002; Lee & Whang, 2001). The demand chain management and supply chain management definitions can be used interchangeably. Proponents of demand chain management terminology try to incorporate in their term the shift in recent times toward more customer power compared to the traditional original equipment manufacturer's (OEM) power (Williams, Maull, & Ellis, 2002), and that all business processes are and should only be carried out in order to meet a specific demand. However, when examining the proposed demand chain management practices and activities, oftentimes the term bears identical meaning to supply chain management construct and prescribes similar chain management practices.

Even so, along the years, SCM has evolved to a much broader definition of value chain or value system management (Christopher, 2005). Beyond that, some authors (Christopher, 2005; Croxton et al., 2002; Frohlich & Westbrook, 2002; Lee & Whang, 2001; Williams et al., 2002) use supply or demand network management instead of supply chain management or demand chain management because firms usually belong to multiple chains at the same time.

2.7 Strategic Supply Chain Management

Strategic supply chain management means that supply chain management is not merely a function that supports business strategy but a key part of strategy (Hult, Ketchen Jr., & Slater, 2004; Ketchen & Hult, 2007b) and strategy implementation (Evans & Danks, 2000; Upson, Ketchen, & Ireland, 2007). In fact, strategic supply chain management (SSCM) is defined as "the strategic, operational, and technological integration of supply chain organizations and activities through relationships, processes, and information sharing to provide member organizations a competitive advantage" (Upson et al., 2007: 78). Moreover, SSCM can "both drive and enable the business strategy of many firms, rather than performing only a part of the operations strategy" (Evans and Danks, 2000: 20). The term strategic supply chain management obviously encompasses all previous definitions mentioned so far for managing the supply chain, such as supply chain management, demand chain management, supply and/or demand network management.

2.8 Strategic Demand Network Management (SDNM)

I do believe the concept of supply chain management has outgrown its name and that strategic demand network management (SDNM) may be a better term that can truly represent what it is, what it enables, and what it tries to achieve. After all, businesses exist to meet customers' demands and hence all supply chains or networks, or "value systems" whether internal or external should be designed, configured and managed to meet those demands (Christopher, 2005; Frohlich & Westbrook, 2002; Lummus & Vokurka, 1999a; Porter, 1985b; Williams et al., 2002). And because most firms belong

to multiple chains at the same time, comprising a network, ‘SDNM’ terminology is more appropriate and can be used to refer to all the practices that fall under SCM practices identified in the reviewed extant literature. Therefore, the definitions listed and the practices identified and used in extant SCM literature will be designated as SDNM practices, even if they have been originally referred to as SCM practices in the cited literature. Although the terms SCM and SDNM can be used interchangeably, in this work the proposed SDNM term will replace SCM when citing SCM literature because I believe SDNM better serves the integration purpose of this research.

CHAPTER III

SDNM PRACTICES

3.1 SDNM Practices Review

This integration of supply and demand management across different companies requires processes that enable the incorporation of all the activities upstream and downstream the supply chain (demand network) (Fisher, 1997; Fisher et al., 1994). Academic literature and business case studies are filled with examples of successful SDNM practices which have had an impact on a firm's competitive advantage (Li et al., 2006a; Li et al., 2005). SCM, henceforth SDNM, practices are defined as a "set of activities undertaken by an organization to promote effective management of its supply chain" (Li et al., 2005: 620). There is no totally agreed upon specific list of demand network management practices, yet they can loosely fall under the following three macro supply-chain processes: "Customer Relationship Management" (CRM), "Internal Supply Chain Management" (ISCM), and "Supplier Relationship Management" (SRM) (Chopra & Meindl, 2004). Or "Supplier Management Strategy", "Customer Relationship Strategy" and "Supply Chain Management Strategy" as proposed by Wisner (2003).

These three macro supply chain processes encompass the primary and support value chain activities proposed by Porter (1985). According to Porter (1985), primary activities include inbound logistics, operations, outbound logistics, marketing, and sales and service. And support activities include firm infrastructure, human resource management, technology development, and procurement. Moreover, SDNM seeks to

manage the value chain by integrating, coordinating, and collaborating among these primary and support activities in order to synchronize and smoothly operate the value chain processes.

Indeed, SDNM practices are broad in range and include, but are not limited to, the following: supplier partnership, outsourcing, continuous process flow, information sharing, total quality management, purchasing, customer relations, use of electronic data interchange (EDI) and/or enterprise resource planning (ERP) systems, postponement, integration, supply base reduction, supplier involvement, collaborative planning, forecasting and replenishment (CPFR). Some of these practices I will explain and go into greater detail below as I try to relate the practices to the SDNM concept or philosophy.

According to Chopra and Meindl (2004), "Customer Relationship Management" (CRM) practices focus on the interaction processes between the firm and its customers, for example, Order Management and Service are key processes under CRM. While Design Collaboration, Sourcing, Negotiating, Buying and Supply Collaboration are key processes under "Supplier Relationship Management" (SRM) which focus on the interaction processes between the firm and its suppliers. And "Internal Supply Chain Management" (ISCM) focuses on all the processes internal to the firm carried to fulfill the customer demand like Strategic Planning, Demand Planning, Supply Planning, Order Fulfillment and Field Service (Chopra & Meindl, 2004). Each of these processes entails complex and non-trivial sub-processes that need to be accomplished before the macro-

processes can be integrated and managed as a whole in order manage the entire supply chain.

Although some of these processes are inter-firm processes by nature and can easily be extended to be SDNM process, others need additional processes in order to integrate them across the demand network. In the coming paragraphs a review of SDNM literature examines SDNM practices and a subset of the listed practices are explained, and used for the purposes of this research.

The Global Supply Chain Forum at Ohio State University identifies the following processes as key supply chain processes: Customer relationship management, Customer service management, Demand management, Order fulfillment, Manufacturing flow management, Procurement, Product development, and Returns management (Chen & Paulraj, 2004). Tan, Layman, and Wisner (2002) on the other hand identify six supply chain management practices: Supply chain integration, Information sharing, Supply chain characteristics, Customer service management, Geographical proximity, and just-in-time (JIT) capability (Tan et al., 2002). Although the above could be considered management processes, Mentzer et al. in their 2001 work scan the literature and list a set of SCM (SDNM) activities that they believe are required for successful SCM. These SCM activities are: Integrated behavior (Supply Chain Orientation), Mutually sharing information, Mutually sharing risks and rewards, Cooperation, Congruence of servicing the customer goal, Integration of the processes, and Building and maintaining long-term relationships between partners (Mentzer et al., 2001).

SDNM strives to develop a collaborative relationships between the buyers and suppliers in order to obtain a "collaborative advantage", which is the competitive advantage created jointly by collaborating partnering firms within the value chain (Contractor & Lorange, 1988; Dyer, 1997; Dyer, 2000). This is critical to competitive advantage because the dyadic relationship between the buyers and the suppliers has become the unit of analysis and of great importance to the success of the supply chain (Chen & Paulraj, 2004; Dyer, 1997; Dyer, 2000; Dyer et al., 1998; Dyer & Hatch, 2006). Moreover, some of the SDNM practices common in buyer-supplier relationships are: Supplier base reduction, Long-term relationship emphasis, Communication, Cross-functional teams, and Supplier involvement in buyer projects (Chen & Paulraj, 2004). Tummala, Phillips, and Johnson (2006) noted that supply chains (demand networks), in an effort to implement successful SCM strategies, also emphasize customer-supplier relationships, information communication technology, material flow re-engineering, corporate culture, and performance measurement (Tummala et al., 2006).

In a more recent work on SCM practices, Li et al. (2005) and Li et al. (2006) cite many practices from previous literature, in addition to the above mentioned practices, such as, agreed vision and goals, cooperation, process integration, agreed supply chain leadership (Min & Mentzer, 2004), and internal integration (Pagell, 2004). In addition, Li et al. (2005) develop six dimensions of SCM practices and research and show their ability to lead to enhanced competitive advantage (Li et al., 2005). These six constructs are: Strategic supplier partnership, Customer relationship, Information sharing, Information quality, Internal lean practices, and Postponement (Li et al., 2005). In their

2006 work, Li et al. find that high levels of five of the above mentioned six SCM practices can lead to improved organizational performance and enhanced competitive advantage (Li et al., 2006a).

It is clear that there are certain SCM (SDNM) practices that are common among all the above cited practices and again, they fall under the three macro processes identified by Chopra and Meindl (2004) and others. For the purposes of this work, an inclusive set of SCM practices is chosen and is designated as SDNM practices. It is clear that information sharing is critical to the SDNM philosophy, and so is customer and supplier long term strategic relationship management. Supplier relationship management could include procurement, product development and establishing a strategic partnership, and is a necessary step before any of the SCM activities suggested by Mentzer et al. (2001) could be carried on. And so is the case with long term strategic customer relationship management. Above that, internal practices needed to fulfill the orders can benefit greatly from the strategic relationships with suppliers and customers. Hence, Strategic partnerships and relationships with suppliers and customers will be chosen as part of our SDNM practices subset in addition to the internal SCM practices.

Information sharing is also often mentioned as a critical and necessary part of any SCM practices list. It can result from the strategic partnership relationship between supply chain members and at the same time facilitate the creation and development of this strategic relationship. It is the foundation upon which coordinative and collaborative decisions can be made among supply chain members (Harland et al., 2007; Holland, 1995; Hult et al., 2004; Kim, Cavusgil, & Calantone, 2006; Lee et al., 2000;

Lejeune & Yakova, 2005; Lummus & Vokurka, 1999a; Narayanan & Raman, 2004; Sahin & Robinson, 2002; Sahin & Robinson, 2005; Sanders, In press; Yu, Yan, & Cheng, 2001). Therefore, the level and the quality of the information shared among the supply chain members is an essential element of our chosen SCM practices subset, as also identified by Li et al. (2006). Information sharing whether it is sharing of explicit information or tacit know-how requires that the sharing partners trust one another (Dyer & Nobeoka, 2000). Trust between partners develops more effectively when incentives and purposes of the partners are aligned and a shared identity is created. Once the partners are willing to share information (Lee, 2002), they can use any of the modern communications means such as the fax, email, Electronic Data Interchange (EDI), extranets and Enterprise Resource Planning (ERP) (Lee, 2002; Sahin & Robinson, 2005). Of course, more tacit know-how will require higher levels of trust, continuous and repeated interactions, and joint developments in order to be transferred and shared (Uzzi, 1997).

Manufacturing flow management and order fulfillment are internal SCM practices (Cooper et al., 1997a; Croxton et al., 2001; Croxton et al., 2002; Lambert & Cooper, 2000; Lambert et al., 1998) which can be combined with internal lean practices (Li et al., 2005) and other practices identified by Chopra and Meindl (2004) under the internal supply chain management (ISCM) practice. Postponement is another internal SCM practice that is essential in current dynamic times to maintain flexibility and reduce supply chain costs (Fisher, 1997; Fisher et al., 1994; Lee & Billington, 1995; Li et al., 2005) that is included in the chosen subset. Postponement is only possible if there is

integration and collaboration across the supply chain between the buyers and the suppliers. Hence comes our next set of SCM activities: integrated behavior, integration of processes, cooperation, and congruence and alignment of goals (Mentzer et al., 2001) that connect the three macro processes and are essential for postponement and other important supply chain initiatives. These activities represent the supply chain orientation that promote network alignment. Next I'll list the chosen practices as SDNM practices and explain what they mean and what sub-processes could be included under each practice or activity.

3.2 SDNM Practices Subset

The SDNM practices used in this research to integrate with the strategic management field are the following:

1) Supplier relationship management (SRM) (Chopra & Meindl, 2004; Cooper et al., 1997a; Lambert & Cooper, 2000; Lambert et al., 1998; Li et al., 2006a; Li et al., 2005; Liker & Choi, 2004), is how a firm interacts with its suppliers and includes such initiatives as strategic supplier partnership, supply base reduction, product design collaboration, sourcing, procurement and supply collaboration. Strategic supplier partnership enables creating synergy between buyers and suppliers by complementing and leveraging strategic and operational capabilities of each other in order to obtain competitive advantage (Lamming, 1996; Li et al., 2006a; Li et al., 2005; Monczka et al., 1998; Stuart & McCutcheon, 1996). And reducing the number of key suppliers can lead to improved performance by giving the suppliers more economies of scale, cultivating long-term partnerships and reducing the complexity of managing many suppliers (Choi

& Krause, 2006; Cusumano & Takeishi, 1991; Dyer, 1996b; Dyer & Ouchi, 1993; Helper & Sako, 1995; Kotabe, Martin, & Domoto, 2003; Kusunoki, Nonaka, & Nagata, 1998; McMillan, 1990; Nair & Kotha, 2001; Nonaka, 1990; Shin, Collier, & Wilson, 2000; Song & Parry, 1999).

Product design collaboration is another sub-process of SRM which has been thoroughly investigated in the literature and shown to lead to superior products and shorter time-to-market for new products (Croom, 2001; Deeds, DeCarolis, & Coombs, 2000; Gerwin, 2004; Handfield et al., 1999; Hartley, Zirger, & Kamath, 1997; Iansiti & Clark, 1994; Koufteros & Marcoulides, 2006; Koufteros, Cheng, & La, 2007; Koufteros, Vonderembse, & Doll, 2002; Pavlou, 2004; Pavlou & Sawy, 2005, 2006; Petersen, Handfield, & Ragatz, 2003, 2005; Ragatz et al., 2002; Ragatz et al., 1997; Song & Di Benedetto, 2008; Swink & Song, 2007; Takeishi, 2001; Wynstra & Pierick, 2000). Sourcing, procurement and supply collaboration under SRM promote the selection of suppliers based on long term objectives. Procurement under SRM is concerned with the mutual benefit of the demand network members rather than the traditional adversarial relationship as the buyer and the supplier collaborate on forecasts, production plans, inventory levels and delivery (Chopra & Meindl, 2004; Cooper et al., 1997a; Lambert & Cooper, 2000; Lambert et al., 1998).

2) Customer relationship management (CRM) covers all the processes that take place between the firm and its customers and is critical for meeting the demands of the customer in the most effective and efficient way (Boyaci & Gallego, 2004; Chopra & Meindl, 2004; Cooper et al., 1997a; Croxton et al., 2001; Croxton et al., 2002; Lambert

& Cooper, 2000; Lambert et al., 1998; Li et al., 2006a; Li et al., 2005; Masella & Rangone, 2000; Rynolds & Eisenfelder, 1998; Vickery et al., 2003; Zhao et al., In Press). Customer relationship management processes aim to improve the customer's experience and build long-term relationships with key customers (Aggarwal, 1997; Tan, Kannan, & Handfield, 1998).

A closer customer relationship enables the firm to better understand its customers' needs and wants and respond faster than rival suppliers. Also, closer customer relationships can create 'relational capital' which further facilitates the sharing of forecasts, production plans, point of sale data and other critical information. These in turn, enable better internal demand network management and supplier relationship management (Dyer & Singh, 1998). This connection to the real end customer demand via the intermediate customer(s) instead of forecasted demand enables a more agile and responsive demand network (Christopher, 2000; Christopher & Towill, 2001; Christopher & Towill, 2000; Power et al., 2001) in addition to a better understanding by the customer of the suppliers' capabilities. However, unless the firm uses this close customer relationship to become more flexible and adapt to customer needs, it will not reap the benefits of this long-term customer relationship. Hence, I list the next SDNM practice that is critical to fulfilling the customer's demand.

3) Internal supply chain management (Chopra & Meindl, 2004; Cooper et al., 1997a; Croxton et al., 2001; Croxton et al., 2002; Handfield & Nichols, 1999; Lambert & Cooper, 2000; Lambert et al., 1998; Li et al., 2006a; Li et al., 2005) is concerned with reducing waste and creating more flexible operations inside the firm and include all

processes invoked to plan for and meet customers' demands. The internal supply chain management (ISCM) processes include and are not limited to, strategic planning, demand planning, supply planning, order fulfillment, manufacturing and service flow management, lean practices, agile practices, postponement and other internal processes required to manage and meet the demand (Chopra & Meindl, 2004; Cooper et al., 1997a; Croxton et al., 2001; Croxton et al., 2002; Lambert & Cooper, 2000; Lambert et al., 1998).

Strategic planning is necessary to optimally use and deploy the resources available internally and in the supply network. Strategic decisions such as which markets to serve, and which facilities to build and where to build them and how to allocate production and distribution among facilities significantly affect a firm's competitive abilities. Another process is the demand planning process, a part of strategic planning, that incorporates the demand information obtained through the customer relationship management practice, whether it be forecasts, point of sale data and/or other critical information regarding the customers needs, wants and abilities, to better manage the demand and in turn better manage the internal supply chain and the supplier relationship. Supply planning takes into account the resources created or accessed by strategic planning, the information obtained by demand planning and optimally combines and configures the available resources, whether internal or suppliers' resources, to meet the demand. It also plays a critical role in identifying resources and capabilities that need to be developed in order to meet the demand if they were not available internally or within the supply chain.

Order fulfillment processes on the other hand, can be considered part of the supply planning practice because they are concerned with outlining each order's resources and logistics requirements. The manufacturing and service flow management process can be considered part of supply planning as well. In addition to the above, postponement: keeping generic inventory and delaying the final product configuration until more precise customer demand requirements are known, is another practice that has gained popularity as means for achieving flexibility and lowering costs (Cvsa & Gilbert, 2002; Feitzinger & Lee, 1997; Hoek, 2001). It can lead to lower inventory costs, higher flexibility, and more efficient supply planning because most of the inventory is kept at a generic form (Billington & Amaral, 1999; Christopher, 2000; Christopher & Lee, 2004; Christopher & Towill, 2001; Christopher & Towill, 2000). Indeed, postponed configuration along with information sharing can lead to significant improvements in terms of responsiveness and costs (Jones, 1998). As noted above, it is essential for the internal supply chain processes to incorporate both supplier and customer information, hence indicating the importance of our next SCM practice: information sharing.

4) Information sharing and its benefits have been widely established in academia and practice (Holland, 1995; Kim et al., 2006; Lee et al., 2000; Lummus & Vokurka, 1999a; Mason-Jones & Towill, 1999; Porter, 1985a; Sahin & Robinson, 2002; Sahin & Robinson, 2005; Yu et al., 2001). To enable integrated behavior across the demand network, sharing information among the demand network members is required. Information sharing leads to better supplier and customer relationship management. In fact, without information, it would be difficult to strategically plan the supply or know

exactly what real demand the direct customer is facing. Decisions to coordinate based on information regarding inventory levels, production plans, capacities, forecasts, point of sale data, and marketing strategies across the demand network reduce uncertainties and can lead to enhanced performance (Lee et al., 2000; Sahin & Robinson, 2002; Sahin & Robinson, 2005; Salcedo & Grackin, 2000). Moreover, for the supply planning process to be able to configure and deploy the resources needed to meet the customers' demands, it also requires information sharing.

The level and quality of information shared between the demand network members are important dimensions of the information sharing practice (Li et al., 2006a; Li et al., 2005). Up-to-date marketing plans, true end demand data, and the customers' expectations information for example should be available to all demand network members (Balsmeier & Voisin, 1996; LaLonde, 1998; Mentzer, Min, & Zacharia, 2000; Monczka et al., 1998) in order for each member to be able to configure its supply and enable its supply to meet the demand (Fisher, 1997; Fisher et al., 1994). However, the level of proprietary information and know-how shared with demand network members rightfully differs from one member to another (Dyer et al., 1998; Li et al., 2006a). Some information is of a strategic nature and some other information is of a tactical nature and the timely sharing of the right amount of information with the right entity can be a source of competitive advantage (Jones, 1998). While explicit tactical information such as inventory levels, supply capacity and real demand can be shared electronically, more strategic tacit knowledge is only shared with strategic partners via extensive interactions and requires a lot more time and effort to share.

An important dimension of the information sharing practice is the quality of the information shared (Li et al., 2006a). Information shared with critical suppliers and customers should be as accurate and up-to-date as possible for the demand network members to be able to optimally use them and plan collaboratively (Alvarez, 1994; Chen & Paulraj, 2004; Mason-Jones & Towill, 1997; Monczka et al., 1998). Indeed, accurate and timely information about manufacturing capacities, total system costs, inventory levels, logistics costs and end customers' demands are essential for effective demand network management (Tummala et al., 2006).

From the previous discussion it is clear that the transparency enabled by sharing information between the supply (demand) chain (network) members is an essential requirement for SCM and SDNM practices and the integrated demand network behavior (Childhouse & Towill, 2003; LaLonde, 1998). Moreover, for a firm to willingly share critical information with demand network members, a mutual desire to integrate across processes and stages has to exist between the chain members. This philosophy of total system integration is sometimes referred to as the supply chain orientation, and will be discussed next using the new proposed term of Strategic Demand Network Orientation (SDNO).

3.3 Strategic Demand Network Orientation (SDNO)

In order to successfully implement the above mentioned four SDNM practices, a firm and all the members of the network that it belongs to should adopt a supply chain orientation (SCO), henceforth strategic demand network orientation (SDNO). SDNO can be considered as a philosophical antecedent for the integrated implementation of

SDNM practices. The demand network orientation or in other words, the integrated system wide view and behavior, is defined as "the recognition by an organization of the systemic, strategic implications of the tactical activities involved in managing the various flows in a supply chain" (Mentzer et al., 2001: 11). By emphasizing a total system and holistic approach in managing the supply chain, by emphasizing cooperative efforts to synchronize internal and external supply chain operations and capabilities, and by emphasizing the creation of unique value for the end customer, this integrative philosophy is clearly a critical prerequisite to any effective SCM effort and hence any effective SDNM effort.

Once firms in a demand network adopt a strategic demand network orientation (SDNO), they recognize the importance of integrating and cooperating with the customers and suppliers on similar and complementary activities in order to produce superior products for the end customer. They must integrate key processes within the firms and across the firms by sharing information and using cross-functional and cross-enterprise teams. After adopting the SCO & SDNO and cooperating, firms should collaborate with their supply chain and demand network partners to jointly align the incentives, objectives and processes across the demand network and engender mutual sharing of risks and rewards (Cooper & Ellram, 1993; Cooper et al., 1997a; Ellram & Cooper, 1990; Ellram & Cooper, 1993; Lee, 2000; Lee, 2004; Lejeune & Yakova, 2005).

Coordinating decisions or collaborating on decision making, both facilitated by the SDNO, among the demand network members leads to the sharing of knowledge and also enable each firm to focus on its core competencies which are complementary to its

partner (Chandra & Kumar, 2001; Grant & Baden-Fuller, 2004; Koufteros et al., 2007; Mentzer et al., 2000). Thus, demand network collaboration, which aligns incentives by sharing information, knowledge, risks and profits, holds great competitive advantage potential and is the natural next step after information sharing (Ballou, Gilbert, & Mukherjee, 2000; Boyaci & Gallego, 2004; Sahin & Robinson, 2005; Stock, Greis, & Kasarda, 2000; Udin, Khan, & Zairi, 2006).

The goal of the selected SDNM practices is to integrate, coordinate and align the value chain activities to create synergy and gain competitive advantage against other demand networks (Childhouse & Towill, 2003; Li et al., 2006a; Moberg et al., 2002; Power et al., 2001; Tan et al., 2002). Although tempting, copying SDNM is not a trivial challenge as SDNM and its practices involves much tacit knowledge elements, social elements, and path dependencies (Collins & Hitt, 2006), that make a mere adoption of 'best practices' by other demand networks without consideration for their own idiosyncratic demand network characteristics sometimes a futile endeavor (Fisher, 1997). Kmart's effort to copy Wal-Mart supply chain initiatives only sped up its demise instead of reviving it.

Some practices are designed and implemented to align the incentives of the supply chain members who have their own independent priorities and more often than not, conflicting goals (Narayanan & Raman, 2004). Lack of trust, lack of visibility of partner actions and plans, lack of information, and the lack of awareness or quantification of the consequences of an individual chain member's decisions on the supply chain as a whole lead to misalignment of incentives, and thus inefficiency and

failure of the supply chain alliance (Narayanan & Raman, 2004; Park & Ungson, 2001). SCM and SDNM endeavor to build an aligned and agile supply chain (demand network), which can adapt to market structural shifts and respond to changes in demand and supply with agility and at the lowest cost (Lee, 2004).

These SDNM practices and routines enable both the exploitation of existing knowledge and the creation of new knowledge. This is done by first pooling together multiple sources of diverse knowledge unavailable within an individual firm (Kogut, 2000), and then establishing routines for sharing and integrating the knowledge (Dyer & Nobeoka, 2000; Nonaka, 1991, 1994). The exploitation of the complementary knowledge within the value chain and/or the exploration and pursuit of new knowledge is a critical capability (Rothaermel, 2001). They can provide new growth opportunities for all chain members and hence lead to competitive advantage (Grant, 1996a; Grant & Baden-Fuller, 2004; Zollo, Reuer, & Singh, 2002). They also have implications for the capabilities concept of the RBV (Williams et al., 2002), and have the potential for explaining how capabilities and resources are accumulated and developed through inter-firm relationships.

Moreover, these SDNM practices play a role in creating social capital while at the same time benefit from social capital in building trust and implementing SDNM practices (McGrath & Sparks, 2005). In addition, they are well suited to help in the boundary and other strategic decisions. Therefore, in the following chapters, I integrate the SDNM practices with strategy research by first looking at how these practices relate to dynamic capabilities' processes. Second, I integrate SDNM practices with the

alliance management capability using the relational capital, social capital and network theory perspectives of the strategic management field. In the CHAPTER VI, these practices are integrated with the strategic entrepreneurship (SE) construct in order to enable a SE based boundary decisions.

CHAPTER IV

THE DYNAMIC CAPABILITIES AND SDNM

4.1 Dynamic Capabilities Literature Review

Strategic management research has been concerned with the question of why certain firms attain and sustain competitive advantage during both stable and unstable market conditions (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997). Zahra et al. (2006) propose that firms' dynamic capabilities, which they define as "the abilities to reconfigure a firm's resources and routines in the manner envisioned and deemed appropriate by its principal decision-maker(s)" (Zahra et al., 2006: 918) lead to differences in firms' abilities to identify and exploit future growth opportunities which *could* lead to attaining and sustaining competitive advantage. Clearly these capabilities are especially important in rapidly changing environments (Eisenhardt & Martin, 2000; Helfat & Peteraf, 2003; Teece & Pisano, 1994; Teece et al., 1997) as the firms have to continually update and redirect their resources and their capabilities to integrate and redeploy the resources to maintain their competitive advantage (Sirmon & Hitt, 2003; Sirmon, Hitt, & Ireland, 2007). These capabilities to alter, modify, and redeploy the resources and the capabilities that combine and use these resources as inputs to accomplish the desired strategic goals, can be considered "higher-order" capabilities that can reconfigure and redeploy lower order operational capabilities (Winter, 2003; Zahra et al., 2006).

Before delving deeper into the concept of dynamic capabilities, it is worthwhile to look at other theories in the field of strategic management, which came prior to the dynamic capabilities perspective and that also tried to explain the source(s) of firms' competitive advantage. This will help in building a better understanding of the concept of dynamic capabilities and some of the previous strategic management theories from which it extends. In the past several decades, significant contributions have been made to the field of strategic management. And the most critical question addressed was, and still is, how a firm obtains and sustains competitive advantage. Researchers have looked outside and inside the firm for sources of sustained competitive advantage.

Some have focused on dimensions outside the firm, on the market and on the competitors and on the firm's position in the market in order to suggest how a firm could obtain and sustain competitive advantage (Porter, 1985a). Another external strategy is the strategic conflict strategy of strategizing using the tools of game theory, based on competitors anticipated reactions to one's actions, in order to outsmart the competitors by making strategic moves, such as irreversible investment in firm-specific assets (Shapiro, 1989). Others have noted that although the external environment is important, the first view wrongfully considers all firms to be homogenous in terms of their resource endowment. In their view this did not explain performance differences between firms in the same industry, and hence looked inside the firms at their endowment of heterogeneous resources and capabilities to explain how firms can achieve sustainable competitive advantage within the same industry (Barney, 1991, 2001, 2002; Penrose, 1959; Wernerfelt, 1984). And indeed both internal performance and market strategies

have to be viewed as complementary when developing strategies for competitive advantage (Teece et al., 1997).

The first paradigm, the competitive forces paradigm (Porter, 1979) which is based on the Industrial Organization paradigm of structure-conduct-performance (Bain, 1956; Mason, 1949), addresses the firm's actions to preserve and defend preferred market positions against other competitive forces in order to create monopoly rents (Teece, 1984). In this framing, Porter identifies five forces that the firm has to face in order to gain and sustain competitive advantage. The forces that the firm needs to consider when determining the right position are: the threat of new entrants, the threat of substitutes, the bargaining power of suppliers, the bargaining power of buyers, and the level of competition in the industry's competitive nature and structure (Porter, 1979).

The second paradigm, the RBV (Barney, 1991, 2001, 2002; Penrose, 1959; Wernerfelt, 1984) focuses inside the firm on the firm's valuable, rare, immobile and non-substitutable (VRIN) resources (by resources henceforth I mean tangible and intangible resources) and capabilities (abilities to combine and deploy resources in a unique and valuable way) to create efficiency advantages within the firm in order to create Ricardian rent and surpass the competitors (Barney, 1991; Peteraf & Barney, 2003). The Ricardian rent stems from having one or more of the following: lower costs, higher quality, shorter lead times, and innovative products based on asymmetrical customer needs' information relative to competitors. Of course, the above generic competitive strategies are facilitated by operational excellence and most importantly by successful SCM. The RBV as an efficiency-based theory (Peteraf & Barney, 2003;

Williamson, 1991b), has clear implications for the SCM philosophy since SCM did start and still is to a large extent an efficiency-based business strategy. SCM by definition endeavors to deliver products and services of higher quality, demanded by the market, at lower costs and higher speed than rivals.

Given that demand and supply side factors determine competitive advantage, a firm's ability to integrate supply and demand by meeting and or exceeding market needs more efficiently and effectively than other firms will determine its ability to gain a competitive advantage (Grant, 1996b). This integration of supply and demand management within and across the firms in the supply chain (and consequently the demand network) is again by definition the essence of SCM and SDNM according to the CSCMP SCM definition. Hence, firm specific resources and capabilities are indeed important determinants of the competitive advantage abilities. Although the competitive forces paradigm suggest homogeneous resources across the firms, the performance of leading companies like Dell, HP and Wal-Mart prove that resources and the capabilities to deploy these resources, such as SDNM are heterogeneous across the firms and can be sources of competitive advantage.

Moreover, these capabilities and resources need to be developed internally along a unique firm-specific path because valuable capabilities are seldom going to be readily available in the strategic factor market. And even if they were, unless the buying firm has asymmetrical information compared to the other bidders or is very fortuitous, the efficient markets would most probably compete away any economic rent creation possibilities (Barney, 1986). This capability to outsmart the market in picking resources

requires the firm to be more effective in gathering information and analyzing than the competitors (Makadok, 2001). On the other hand, the ability to build capabilities that enable developing, better utilization and more effective deployment of resources requires the firm to be more effective in designing and constructing organizational systems than the competitors (Makadok, 2001). The next section presents a short review of the relationship between dynamic capabilities and competitive advantage.

4.2 Dynamic Capabilities and Competitive Advantage

There are several dynamic capabilities definitions in the literature (Zahra et al., 2006) and the common theme across all definitions is "the firm's ability to integrate, build, and reconfigure internal and external competences…" (Teece et al., 1997: 516). Some authors go into further detail to point out the managerial decisions' role in developing and using dynamic capabilities (King & Tucci, 2002; Zahra et al., 2006), others divide the dynamic capabilities into higher level dynamic capabilities and zero level operating (substantive) routines and capabilities (Pavlou & Sawy, 2006; Winter, 2003; Zahra et al., 2006) where dynamic capabilities are the abilities to extend, modify and or create operating capabilities, which are the abilities to execute the activities required to operate a business (Pavlou & Sawy, 2006; Winter, 2003). This ability to modify resources, capabilities and consequently competences is the essence of dynamic capabilities regardless of the market conditions. Firms that hope to sustain their competitive advantage never stop renewing themselves even if market conditions are stable and they are in the lead.

Although proposed by some (Griffith & Harvey, 2001; Teece et al., 1997), the ability of dynamic capabilities to directly attain and sustain competitive advantage is questioned by others (Eisenhardt & Martin, 2000; Zahra et al., 2006). The opposing group proposes that having dynamic capabilities is a necessary but an insufficient condition for attaining and sustaining competitive advantage (Eisenhardt & Martin, 2000; Winter, 2003; Zahra et al., 2006). Moreover, they propose that dynamic capabilities indirectly lead to competitive advantage by first developing operational competences relative to competitors which create superior products more efficiently and effectively and that meet and exceed customer wants and needs (Pavlou & Sawy, 2006).

Eisenhardt and Martin (2000) also note that the only way dynamic capabilities can be a source of competitive advantage is if these capabilities are applied faster and smarter to create competitive resource combinations, i.e. core competencies that with some good fortune are more desired by the market than the competition's competencies. This ability to reconfigure and redeploy resources and capabilities quickly based on alert sensing of market opportunities and changes is indeed costly to imitate (Barney, 2001). Transforming firms' resources and capabilities in order to produce products and services that deliver superior value to customers sooner and more astutely than competitors is the ultimate goal of dynamic capabilities and since this transformation and reconfiguration is costly to imitate by competitors, some authors claim that these capabilities indeed are a source of sustained competitive advantage (Wang & Ahmed, 2007).

On a more strategic level, it is also argued that the dynamic capabilities ability to create "Strategic Flexibility" (Hitt, Keats, & DeMarie, 1998; Shimizu & Hitt, 2004),

which is defined as “the organization’s capability to identify major changes in external environment (e.g. introduction of disruptive technologies), to quickly commit resources to new courses of action in response to change, and to recognize and act promptly when it is time to halt or reverse such resource commitments” (Shimizu & Hitt, 2004: 45); or in short “the capability of the firm to proact or respond quickly to changing competitive conditions and thereby develop and/or maintain competitive advantage” (Hitt et al., 1998: 26), is what leads to competitive advantage. Thus, one could assume that through strategic flexibility and operational excellence, dynamic capabilities can lead to successive series of short term competitive advantages. In other words, towards the end of each competitive advantage period, dynamic capabilities help revamp the organizational competencies to match the new contingencies in order to create another period of competitive advantage and thus sustain the competitive advantage.

4.3 Dynamic Capabilities and SDNM

As competition between firms is replaced with competition between supply chains (and demand networks) (Christopher, 2005), the need to identify tangible and intangible resources within the firm and across the demand network with the foresight for their combinative potential, and having the capability to configure and combine them in a synergistic and unique way in order to create a competency that can create and sustain a competitive advantage becomes even more critical for the success of the demand network and for the firms in the demand network. This ability to coordinate and redeploy internal and external competences in response to constantly changing market conditions is extremely important for firms to avoid resource and capability atrophy and

mismatch between supply and demand (Teece et al., 1997). As the proverb goes, "nothing endures but change"; the market conditions change quite often rendering valuable current resources, assets, capabilities, technologies, locations, know-how, and other competences irrelevant.

From the above discussion it can be understood that resources and capabilities are necessary for competitive advantage and that business environments change constantly carrying significant consequences for firms resource endowments' ability to create or sustain competitive advantage. Being aware of this, the dynamic capabilities concept is proposed by Teece et al. (1997) as an extension of the RBV, which emphasizes unique combinations of resources, to emphasize the importance of the ability to renew competences and the strategic management's role in recognizing, integrating, reconfiguring and redeploying internal and external resources and capabilities combinations in a synergistic way to match the new market conditions (Pavlou & Sawy, 2006; Teece, 2007). Nonetheless, it is argued by other literature that dynamic capabilities, although more valuable during uncertain change periods, should not be confined to volatile market conditions as the need to reconfigure operational capabilities may rise from internal conditions as well (Winter, 2003; Zahra et al., 2006).

Zahra et al. (2006) provide a comprehensive review of the dynamic capabilities concept and address some of the ambiguities and confusion regarding what it entails. They also provide several key definitions of dynamic capabilities from seminal previous academic contributions. The definitions they list emphasize the ability to manipulate competencies in order to face changing market conditions, create market change, and or

improve operating routines in pursuit of competitive advantage (Rindova & Kotha, 2001; Teece et al., 1997; Winter, 2003; Zahra & George, 2002; Zahra et al., 2006; Zollo & Winter, 2002). Indeed, the organizational and strategic routines that make up dynamic capabilities seek to create difficult-to-imitate combinations of resources in an effort to gain and sustain competitive advantage in stable and changing markets.

Business competency, also referred to as operating and/or substantive routine and capability, is a set of interdependent capabilities that are combined in a synergistic way for the purpose of "economic gain" (Marcus & Anderson, 2006; Prahalad & Hamel, 1990). As such, the SDNM capability is a business competency that along with organizational knowledge, which is made up of accumulated experience, articulated knowledge and codified knowledge, can determine which capabilities are necessary to develop in order to renew the resource base or meet the change in the market (Zahra et al., 2006; Zollo & Winter, 2002). At the same time, dynamic capabilities affect and modify the firm's business competencies and knowledge base (Zahra et al., 2006). Although the dynamic capabilities and the SDNM seem to be highly related, no explicit relationship between the two is articulated in either's literature. And this is the main contribution of this work, proposing and showing that SDNM practices both affect and are affected by dynamic capabilities, i.e. related.

The definitions of SDNM and dynamic capabilities suggest that internal and external coordination, collaboration, and synchronization in the demand network are necessary for enabling dynamic capabilities. And that the dynamic capabilities can

guide the development of SDNM practices and processes. Next I elaborate on some common antecedents to effective SDNM and dynamic capabilities.

4.3.1 Common factors

According to Teece et al. (1997), the managerial and organizational processes, based on the strategic capability development paths available to the firm due to the firms resource position and capability evolution history, are significant drivers of competitive advantage. They further propose that these organizational and managerial processes necessary to develop dynamic capabilities need to enable learning, coordination/integration and reconfiguration of resources both internally and externally. Moreover, they list technological assets, complementary assets, financial assets, reputation assets, structural assets, institutional assets, market structure and organizational boundaries as firm specific assets that determine the firm's strategic posture (Teece et al., 1997). Thus, the position and the path taken determine how organizational processes exploit future available options.

Coordination and integration between functions within the firm and between partners help identify opportunities for developing new core competences and also help identify decaying competences that could create "core rigidities" (Leonard-Barton, 1992) sooner than if there was no coordination. Coordination as I have already shown in a previous chapter is a critical part of SDNM practices. Iansiti and Clark (1994) propose that the integration capability of an organization, both internal integration of subunits and external integration of customer needs and of technological advances will determine the organization's ability to respond to contingencies (Iansiti & Clark, 1994).

Integration processes such as coordination, selection, and combination not only enable the building of the firm's dynamic capabilities (Eisenhardt & Martin, 2000; Teece et al., 1997; Verona & Ravasi, 2003; Zahra et al., 2006), but also are important dimensions of the SDNM (Alvarado & Kotzab, 2001; Christopher, 2005; Christopher, 1992; Frohlich & Westbrook, 2001, 2002; Parker & Anderson, 2002; Sahin & Robinson, 2002; Sahin & Robinson, 2005; Thomas & Griffin, 1996).

From the SCM definition adopted for SDNM, we know that SDNM integrates supply and demand management within and across companies in the value network. It is an integrating strategy linking business functions and processes within and across companies in a coordinated, synchronized, collaborated, and aligned manner (Lee, 2004). To enable this integration of supply and demand, supplier relationships, customer relationships, and internal supply chains should be managed in an aligned way; end-to-end visibility and collaborative management as if all entities belong to a vertically integrated firm without the costs and rigidities of a vertical firm. Dynamic capabilities also try to integrate, to reconfigure, to renew and to recreate the resources and capabilities within and across the chain in order to develop new core competencies that integrate supply and demand faster, more efficiently, and more effectively than competitors and in turn lead to attaining and sustaining competitive advantage (Eisenhardt & Martin, 2000; Wang & Ahmed, 2007).

Although the majority of the dynamic capabilities' research has posited it as a firm level competency, I propose the SDNM capability and processes as the means for extending it to the demand chain and network level. Dynamic capabilities and SDNM

both adapt a holistic and systemic view of managing the whole chain, whether internal or external, to sense and shape new opportunities and market changes, seize such opportunities, and most importantly execute the necessary processes in a collaborative manner to meet the new competitive conditions. Learning, for example, is an important element of dynamic capabilities and is also important to SDNM. Therefore, SDNM's emphasis on total demand network visibility, sharing of demand and supply information has clear implications for the dynamic capabilities' effort to sense and learn in order to be able to reconfigure and redeploy resources and competences. Both constructs share common underpinning processes and hence integrating the SDNM and dynamic capabilities should add to the body of knowledge of each concept. Next section will elaborate on the applications and processes making up dynamic capabilities.

4.4 Dynamic Capabilities: Processes and Applications

Academics have proposed several capabilities as either dynamic capabilities in themselves or as manifestations of dynamic capabilities. For example, some of the examples of dynamic capabilities are: "process R&D", restructuring, re-engineering and post-acquisition integration (Zollo & Winter, 2002), alliance management, product development, strategic decision making (Eisenhardt & Martin, 2000), and the reconfiguration of resources (Pavlou & Sawy, 2006). They are considered dynamic capabilities because these processes require resource integration such as in product development routines, or resource reconfiguration such as in resource transfer, replication and allocation, and or resource gain and release such as in knowledge creation and alliance routines (Eisenhardt & Martin, 2000). These capabilities have been

extensively researched and have been shown to affect firms' abilities to obtain and sustain competitive advantage. Although the listed capabilities are not exhaustive, they help a firm renew itself, endure, and prevail over external turbulences; thus, they are the essence of dynamic capabilities and its means for achieving and sustaining competitive advantage. It is ultimately the ability to reconfigure the resources controlled and/or accessed by the firm to meet new conditions, the ability to create new resources and capabilities and the ability to create strategic flexibility that prevent internal atrophy and chaos.

And by definition, dynamic capabilities can clearly benefit from SDNM practices, which allow and enable a total system visibility and integrates supply and demand management on a process and operations level within and across companies to give the firm the ability to identify the unique resource combinations and the ability to combine, configure and deploy these value enhancing combinations. The SDNM practices involve a great deal of tacit elements and can be very complex. In fact, complex integration processes of complementary and congruent competencies, inside the firm and across firms comprising the demand network on a process, functional and interfrim level, required to develop these dynamic capabilities can create causal ambiguity which in turn can enable the firm to sustain its competitive advantage (Marcus & Anderson, 2006).

Effective and successful change depends on taking into account the effects of the change on every value network process and every member of the interdependent network, albeit to a varying extent. The value process can be internal, external or more

likely span across the demand network members. SDNM practices give the firm this holistic view and the capability to manage the interdependent relationships, and they also can help bring all chain members along when it is time to reconfigure, redeploy and change. Thus, an appropriate research path would be to consider the relationships between SDNM practices and dynamic capabilities. Dynamic capabilities both affect and are affected by operating competencies and strategies (Pavlou & Sawy, 2006). And, SDNM as a business strategy and tactical competency falls in between higher level dynamic capabilities and lower level operational competencies; hence, it can both affect and be affected by dynamic capabilities.

For the purposes of this work, I will adopt the definition of dynamic capabilities as the "ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997: 516). Although many definitions for dynamic capabilities have been proposed since seminal work of Teece and his colleagues in 1997, I believe that the subsequent definitions are, to a great extent, reiterations of the original definition as the Zahra et al. (2006) definition quoted above shows. For example, Wang & Ahmed (2007) define dynamic capabilities as "a firm's behavioral orientation constantly to integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environments to attain and sustain competitive advantage" (Wang & Ahmed, 2007: 35) is clearly an extension and a reiteration of the definition adopted for this work. Moreover, the adopted definition avoids any direct relation to competitive advantage which is, as discussed previously, debatable. The

adopted definition is the original and most simple definition that encompasses all the listed examples of dynamic capabilities above. Whether it is product development, or alliance management, or re-engineering process, they all require the integration of, the building of, and the reconfiguration of internal and external competences, as the chosen definition explicitly states.

In order to integrate the SDNM and dynamic capabilities research, a set of the dynamic capabilities' processes must be chosen first. Teece et al. (1997) proposed coordination, integration, learning, reconfiguration and transformation as organizational processes that determine a firm's distinctive dynamic capabilities along with its resource position and its capability development path. Eisenhardt and Martin (2000) identify product development routines, strategic decision making, replication routines, resource allocation processes, coevolving, patching, knowledge creation routines, alliance routines, acquisition routines, and exit routines as dynamic capability routines and/or applications of dynamic capabilities that have been subject to extensive empirical research in their own right. However, these latter routines and processes still require integration, reconfiguration, gain and release of resources before they can be deployed according to Eisenhardt and Martin (2000).

Pavlou and Sawy (2006) on the other hand propose the reconfiguration of resources as the goal process of dynamic capabilities and the sensing of the market environment for needs and opportunities, the process of learning what has been sensed to build and enhance appropriate competencies, the coordination of activities, and the integration of patterns of interactions as the reconfiguration enabling processes.

Moreover, Teece (2007) disaggregates dynamic capabilities into "the capacity to 1) sense and shape opportunities and threats, 2) seize opportunities, and 3) maintain competitiveness through enhancing, combining, protecting, and when necessary, reconfiguring the business enterprise's intangible and tangible assets" (Teece, 2007: 1319). Therefore, both works propose breaking down the processes that make up dynamic capabilities into goal process and enabling processes, i.e. complementary processes, that when combined together, lead to dynamic capabilities.

Although Teece et al. (1997) propose that dynamic capabilities are unique and firm specific, Eisenhardt and Martin (2000) note that dynamic capabilities, though idiosyncratic in their details, have common features across firms, which could lead to substitutability and equifinality of the dynamic capabilities. Wang and Ahmed (2007) build on this notion of common features to propose adaptive capability, absorptive capability (Cohen & Levinthal, 1990), and innovative capability as common factors that reflect the sensing, seizing, and taking actions to maintain competitive advantage by reconfiguring existing or creating new resources. Adaptive capability indicates the firm's ability to sense market opportunities, and absorptive capability is defined as "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends … the ability to evaluate and utilize outside knowledge is largely a function of the level of prior knowledge" (Cohen & Levinthal, 1990: 128), and it positively affects a firm's ability to learn new knowledge, integrate it, transform and deploy it. And last, innovative capability indicates a firm's ability to develop new

products and/or new processes and organizational forms, and identify new markets and/or new sources of supply (Wang & Ahmed, 2007).

It can be noted that the abilities to sense and seize market changes and opportunities, the ability to learn, the ability to coordinate and integrate, and the ability to reconfigure are common among all above conceptualizations of dynamic capabilities. Reconfiguring capability is the ability to build, combine and reconfigure resources and operational competencies in response to the identified market changes and opportunities in order to gain and sustain competitive advantage. The key processes and capabilities that underlie dynamic capabilities as identified by Teece et al. (1997) and others are: sensing and learning capability, the coordination/integration capability, and the reconfiguration capability (the goal or ultimate process) (Harreld, O Reilly, & Tushman, 2007; Pavlou & Sawy, 2006; Teece, 2007; Teece et al., 1997). These processes enable the identification of new market opportunities and enable the use of efficient and effective processes to seize these opportunities by configuring or reconfiguring the firm's resources and capabilities to match the new conditions and thus *"explain the essence of the firm's dynamic capabilities and its competitive advantage"* (Teece et al., 1997:518). The three organizational processes that together constitute a firm's unique dynamic capabilities are:

1) The sensing and learning capabilities. Sensing capability can be defined as the firm's ability to sense market changes, resource gaps and market opportunities better than rivals. The sensing capability requires the firm to build market intelligence, interpret market intelligence, share the market intelligence within the firm and across the

value chain (Kogut & Zander, 1996) and be able to respond to market intelligence (Amit & Schoemaker, 1993). The learning capability is defined as the "the ability to acquire, assimilate, transform, and exploit knowledge to generate new knowledge" (Pavlou & Sawy, 2006: 7). The reason I have combined sensing and learning capabilities together in this work is because often they have to exist together for either to be effective. Unless there is sensing ability, there can't be a learning process and unless there is a learning process, sensing ability is will not be exploited effectively. Without learning and knowledge building, a firm will be unable to discern the environment effectively, i.e. sensing capability.

Experience accumulation, knowledge articulation and knowledge codification are learning mechanisms that enable the learning process and lead to reconfiguration capability and eventually dynamic capabilities (Zollo & Winter, 1999; Zollo & Winter, 2002). Moreover, a firm's knowledge evolves through a learning cycle which first starts by an external stimulus that is picked up by a firm's scanning activities and then the firm combines its experience and knowledge with these external stimuli, which could be technological changes, market changes, and/or competitor actions. The second stage of the cycle involves selecting the combinations that have the potential for increasing internal competencies or creating new ones. In the third stage, the firm diffuses the new combinations by sharing the new knowledge with the relevant parties in order to leverage this new knowledge. In the last stage, the firm enacts the new capabilities to create new routines that when taken with other routines and capabilities can create new competencies (Zollo & Winter, 2002). These new competencies in turn add to the

knowledge base and experience accumulation, which the firm then combines with the next stimulus. Note that routines are defined as "stable patterns of behavior that characterize organizational reactions to variegated, internal or external, stimuli" (Zollo & Winter, 2002: 340).

Dynamic capabilities are also used to gain and release resources through knowledge creation routines, and alliance routines which are also dependent on the firms ability to identify and learn new capabilities from external routines (Eisenhardt & Martin, 2000). Acquisition routines and exit routines also require sensing abilities to identify potential synergistic combination of complementary resources and capabilities for acquisition or to identify incompatible and/or decaying resources for timely exit decisions.

The sensing of change in the market, whether technological, demand related, and or rival-related is thus a critical part of the dynamic capabilities' development process. On a more basic level, the sensing capability is also important for the resource-picking concept emphasized by the RBV. Thus, sensing is not only important for dynamic capabilities but also necessary for identifying synergistic combinations of resources and capabilities available within the firm, across the demand network or in the strategic factor market in all times. Therefore, sensing capability clearly has an impact on SDNM and is impacted by SDNM as I explain in the next section.

2) The coordination and integration capabilities. They are also identified by Teece et al. (1997) as organizational processes required for strategic advantage and for dynamic capabilities. And in thin markets, characterized by transactional complexity

and contractual hazard, firms turn to internal allocation of resources in the form of vertical integration and or allocate resources across the demand network through long term strategic relationships in order to avoid arm's-length market exchange (Coase, 1937; Williamson, 1975, 1985). This internal allocation, due to co-specialized and idiosyncratic assets, requires the management to coordinate and orchestrate the assets in order to assemble unique configurations of the assets that can lead to value enhancement. Above that, firms differ in how they conduct and coordinate activities internally and externally, thus suggesting that coordination capabilities and routines are firm specific. Moreover, empirical research has shown that these differences have significant impact on the quality of the end products, the costs and the lead times of product development projects (Clark & Fujimoto, 1991; Rothaermel et al., 2006).

Coordination and integration capabilities are conjoined and are important processes during both stable and change periods as they are the means by which the firm manages the congruencies and complementarities between interdependent resources and processes. Via the integration of information and knowledge of individual activities, firms coordinate to execute collective activities (Grant, 1996a) because by coordinating the different interdependent activities, firms can allocate resources, assign tasks and synchronize these activities in the most efficient and effective way (Pavlou & Sawy, 2006). Iansiti and Clarck (1994) found, in their study of the automobile and computer industries that the integration of knowledge was a critical driver of dynamic capabilities and hence better performance from the perspectives of product quality, productivity, and lead time.

In addition, the resource integration process is clearly visible in new product development routines (NPD) where firms combine and integrate resources, capabilities and competences from different functional units, internally and externally in developing new products. Another application of resource integration is the process of strategic decision making. When making a strategic decision, a firm has to integrate its accumulated individual and corporate experiences, and integrate inputs from all affected and concerned units. Therefore, integrating knowledge from all processes and entities can greatly benefit the operational capability.

Although decentralization becomes critical as firms expand in order to maintain flexibility and responsiveness, it can compromise the ability to integrate. Hence, in dynamic environments, firms must balance decentralization and integration of knowledge in order to enable the coordination of activities that must be carried out in a coherent manner. Coordination capability is also required in NPD processes, strategic decision making, alliance routines, acquisition routines and exit routines. Coordination, defined as "the process of integrating identified capabilities into effective yet efficient capability configuration" (Sirmon et al., 2007: 277) is a critical sub-process of resource management processes' leveraging capability. Mobilizing, coordination and deploying abilities together make up the leveraging capability; which "refers to the application of a firm's capabilities to create value for customers and wealth for owners" (Sirmon et al., 2007: 277). Thus, the coordination capability is critical for resource management and has clear implications for both dynamic capabilities and SDNM perspectives.

3) The reconfiguration capability/process of dynamic capabilities. It is, according to Pavlou and Sawy (2006) and Teece et al. (1997), the goal process of dynamic capabilities. Moreover, it reflects the capacity "to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets" (Teece, 2007:1319). The reconfiguration process is defined as the "the process of deploying existing resources into new configurations of operational competencies that better match the environment" (Pavlou & Sawy, 2006: 4) and the reconfiguration capability is defined as "the ability to deploy new configurations of operational competencies that better match the environment" (Pavlou & Sawy, 2006: 7) and according to Pavlou and Sawy (2006), it is enabled by the sensing, learning, integrating and coordinating capabilities.

The processes of recombining and reconfiguring intangible and tangible resources within the firm and across the demand network are key to sustainable competitive advantage in times of market and technological uncertainty and change (Teece, 2007). Although Eisenhardt and Martin (2000) suggest multiple paths to the such dynamic capabilities, the potential for sustained competitive advantage lies in using these capabilities faster, sooner, more astutely, more effectively, and/or more fortuitously than rivals to create synergistic resource combinations that engender continuous series of short-term competitive advantages.

For the reconfiguration capability to be effective, it has to be appropriate, and performed in a timely and efficient manner (Galunic & Rodan, 1998; Kogut & Zander, 1996; Pavlou & Sawy, 2006; Zott, 2003). Reconfiguration capability enables the

transfer and replications of routines and the allocation of resources within the firm and across the demand network. NPD processes also require resource reconfiguration capabilities, to reconfigure product development operational competencies, to achieve competitive advantage along the quality, the innovation, the lead time and the cost dimensions concurrently (Kusunoki et al., 1998). Because the resource reconfiguration capability is the goal process of dynamic capabilities enabled by the sensing and learning capabilities, and the coordinating and integrating capabilities, it will have clear implications for the SCM capability, implications on which I elaborate later.

In the next section, an effort is made to integrate the SDNM practices with the organizational process that determine a firm or a demand network's unique dynamic capabilities. SDNM practices and dynamic capabilities' processes research are integrated with the goal of expanding knowledge in the two areas and the interrelationship between them. SDNM's quest for agility, flexibility and alignment play a significant role in the development and deployment of dynamic capabilities. Also, it can support dynamic capabilities' efforts to identify resources and capabilities for successful redeployment to meet internal and external needs. On the other hand, the quest for dynamic capabilities can guide and frame the SDNM's pursuit of agility and flexibility, and use the SDNM capability strategically in pursuit of competitive advantage.

4.5 SDNM Practices and Dynamic Capabilities

In many industries, as the products become more complex and the sources of knowledge become globally dispersed, no longer can an individual firm develop all the

necessary knowledge and capabilities required to develop such products in a value creating manner that enables it to gain and sustain competitive advantage (Prahalad & Hamel, 1990). Therefore, in many industries, many firms have decided to focus on their core competencies and outsource the activities that are the core competencies of other firms. The decision to divest non-core businesses, taken by many firms, has led to the creation of a chain or a network of independent suppliers and customers that may have once been part of the same vertically integrated organization.

The ability to align the internal units of any firm is an extremely important process in order to be able to integrate supply and demand management and efficiently create value for the end customer (Narayanan & Raman, 2004). One can imagine how important, and at the same time how difficult, the alignment of processes between independent yet interdependent firms making up the demand network is, especially in the absence of fiat. Therefore, in order to identify the unique and synergistic combinations of resources and capabilities that are dispersed across the chain of independent firms, firms must adopt a holistic network management approach, which the SDNM capability enables. Before I explore the direct relationship between dynamic capabilities and SDNM, I examine the relationship between SDNM and RBV under the efficiency paradigm. The SDNM capability provides visibility of the network which can play a role in resource picking, resource configuring and resource combining capabilities, especially for resources spanning firm boundaries. Moreover, SDNM can extend the static RBV concept beyond the firm to the supply network while at the same time provides it with the needed dynamism.

RBV theory presents the firm as a bundle of heterogeneous assets (resources and capabilities) and stipulates that a firm attains and sustains competitive advantage by implementing value-creating strategies using resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991; Grant, 1991). This ability to combine and deploy resources and capabilities to create competencies has to apply to resources and capabilities diffused throughout the demand network (internal and external). Indeed, the linkages a firm has with its demand network members can help it identify and acquire VRIN tangible and intangible resources that it can subsequently configure and deploy to gain operational advantages (Rungtusanatham et al., 2003).

Hence, I posit SDNM as a business competency and a tactical capability that spans and connects strategic and operational capabilities. The strategic and tactical nature of SDNM rightfully enables it to link the day-to-day network operations to the business strategy. Moreover, SDNM by definition covers the movement and transformation of material, funds, information and knowledge. Next I relate the SDNM practices identified in CHAPTER III with the dynamic capability processes provided above.

However, an important concept to remember is the SDNO philosophy, which supports all the separate demand network management practices. It encourages and connects the SRM, CRM, information sharing and ISCM to enable the total SDNM needed for integrating supply and demand management within and across the demand network. Firms belonging to a demand (supply) chain or a network of interdependent firms are realizing the potential benefits of adopting the SDNO compared to the

adversarial attitude towards their suppliers and customers long practiced by many firms. And through active SDNM a firm can effectively supersede rivals in identifying changes occurring throughout the demand network, integrate knowledge and activities, and coordinate between the different entities in order to combine, configure or reconfigure its and the networks resources.

In the following, I elaborate on how each SDNM practice relates to each dynamic capability process and vice versa and provide a set of propositions summarizing the relationships. First, I start with the relationship between SDNM practices and the sensing and learning capabilities, followed by the relationship between SDNM practices and the integrating and coordinating capabilities and so forth until all SDNM practices have been related to all dynamic capabilities processes. Each part may cover one side of the picture and by combining all practices and processes I endeavor to have a better understanding of the nature of the relationship between SDNM and dynamic capabilities.

4.5.1 SDNM practices and the sensing and learning capabilities

The sensing and learning capabilities were first on the list of processes constructing dynamic capabilities because only after sensing a threat or an opportunity can a firm respond by trying to integrate knowledge from various sources, coordinating its activities and configuring, or reconfiguring, the new value enhancing resource combinations. The sensing capability is not only important in times of instability but is as important in times of stability because a firm must scan and sense new opportunities at all times, both inside and outside the firm in order to be able to improve on and sustain its operational excellence and advantage. The firm has to scan and sense value

enhancing resource combinations, both internally and externally, that could enable it to gain and sustain an edge over its competitors, or risk falling behind. And so is the case for the learning capability, by which the firm learns new knowledge in order to improve its operational competence. The firm has to continue learning in order to improve the effectiveness and efficiency of its processes in both stable and unstable times, albeit it becomes more critical in unstable times. SDNM practices discussed in section 3.2 can clearly relate to the sensing and learning capabilities.

On the other hand, the dynamic capabilities' promotion of capabilities to integrate, to combine, to configure, and to deploy internal and external competences consciously, proactively and repeatedly as environmental conditions necessitate has clear implications for the SDNM capability. It can clearly guide and affect the SRM processes, the CRM processes, the information sharing processes and the ISCM processes to better manage the demand network, to create an agile and responsive demand network, and as a result gain and sustain competitive advantage.

The SDNM capability's SRM practice and its sub-processes: strategic supplier partnership, supplier base reduction, product design collaboration, sourcing, procurement and supply collaboration can all affect the sensing and learning capabilities. For example, continuous and proactive evaluation of suppliers in order to optimize the reduced the supplier base can not only reduce the cost and effort needed to coordinate with its suppliers, but also give the qualified suppliers more economies of scale in order for them to develop more expertise and to make larger specific investments in both assets and R&D (Dyer, 2000). Also, long-term relationships with fewer suppliers enable

better monitoring and learning by both and the firm and its suppliers, thus making the interdependencies within the entire chain more visible, understandable and manageable. As the relationships between the suppliers and the firm turn to strategic partnerships, both will work toward the mutual benefit of the buyer-supplier chain by scanning and sensing the environments more proactively for opportunities and/or changes that could affect the value provided by the chain to the end customer. Additionally, the complex learning process is further facilitated by the strategic partnership between the firm and its smaller supplier base with whom it can interact more frequently.

More effective product design collaboration is another benefit of the supplier relationship management process's emphasis on smaller supplier base and strategic partnership. Verily, working in an integrative manner with one's suppliers and customers lowers costs and improves the products, and can help sense technological changes upstream and market changes downstream faster than rivals who do not have such strategic partnerships with their suppliers and customers. Additionally, working in a concurrent fashion can produce better learning capabilities as the firm and its suppliers work jointly to learn the new consensually and collaboratively developed knowledge and assimilate and deploy it across the chain at the same time, thus leading to a smoother coordination and synchronization across the network companies.

Technological change can affect the firm's and its "co-opetitors" (suppliers and customers) capabilities directly or indirectly by affecting one or all members of a network (Afuah, 2000). Thus, a firm must constantly scan the environment for changes or opportunities that might affect itself, its suppliers, customers and even competitors.

And only by knowing the supplier's true capabilities can a firm take the most informed actions to deal with forthcoming changes or opportunities. SRM management then, helps build an aligned relationship with the suppliers and also help integrate the information, the knowledge and the activities resulting from the other SDNM processes and thus lead to better sensing and learning capabilities, which are important dimensions of dynamic capabilities.

On the other hand, because a firm in a demand network is often a customer to a group of suppliers while concurrently a supplier to a group of customers, much of the arguments made integrating SRM and the learning and sensing capabilities applies to CRM also. Nonetheless, a more effective supplier examines at how the customer uses its products and also looks beyond its direct customer at how the end user uses the end product produced and delivered by the intermediate customer(s). A product delivered by a firm can still go through several value adding processes through more than one firm until it reaches the end customer. Hence, CRM's goal is to understand the customer and improve the customer's experience in order to establish long-term relationships with the customers.

In order to better manage the firm's resources, and better meet the customers' requirements, a firm must actively manage its relationship with its customers. Any relationship is made up of two sides at least and belonging to a chain naturally means that a firm plays a dual supplier and customer roles. Therefore, all the SRM sub-processes discussed above are also applicable to CRM but in this case, the firm plays the supplier role. In addition, through CRM a firm becomes aware of the end user's true

demand and not just the direct customer's demand, which can often be misleading due to contingency considerations that inflate the intermediate demand beyond the network optimal order levels. A firm, through active CRM, can also be better informed of its customers' promotional plans that might have an effect on its ability to deliver according to the customers' needs which consequently affects the customer's service level.

Sharing point of sale data and interchanging data electronically requires more than just the transfer of information; it requires active management of the customer relationship in order to first of all convince the customers to share the data. And once available, the firm has to sort through the data and assimilate the information and knowledge before it can act upon it. Moreover, CRM often involves more than just identifying the customer's needs and coordinating the delivery of the products to the customer. Vendor managed inventory (VMI), for example, is the name of a process through which the customer hands over the inventory replenishment process entirely to the supplier, thus making the supplier in charge of a critical process that can affect product availability and eventually the customer's profitability.

Moreover, in interfirm product development projects, firms integrate with their suppliers on varying levels. They either independently design products and ask for quotes, or jointly develop the product with their suppliers, or totally leave the product development process to the suppliers (Koufteros et al., 2007). The last category of integration is unlikely to effectively learn, know and meet the customer's tacit requirements without an effective CRM and SRM processes in place.

Therefore, CRM is critical to the sensing and learning capabilities. Through proactive CRM a firm is able to identify and understand its real immediate demand and the true end customer's demand. Through CRM, the sensing ability can identify any new product and its requirements that a customer may be planning to introduce, and hence enable the firm to plan and design the necessary processes and products before potential rival suppliers can do so. Also, without CRM, a firm may not be able to effectively learn the new knowledge the customer is developing and the new competence configurations it is planning to build and deploy. In addition, CRM gives the firm the visibility of the end market conditions that may affect it directly or indirectly by affecting its direct or indirect customers. This is in addition to CRM's role in clarifying any misunderstandings that could arise and its role in creating relational capital which sets the foundation for and supports long-term strategic partnership (Dyer & Singh, 1998). Hence, not only does CRM enable sensing market changes, but it also enables the sensing and learning of resource combinations that can create value for the chain in both stable and unstable environments. This is because CRM helps a firm identify and integrate its customers' capabilities and resources and provide knowledge and information of its capabilities to its customers.

Through integrating inputs from SRM, CRM and information sharing processes, ISCM can better configure the internal processes and integrate and synchronize them with other processes across the demand network in order to seamlessly balance supply and demand. The supply planning process can be considered as the core process of the ISCM process that incorporates the demand information from the CRM and the supply

information from the SRM via the information sharing systems in order to fulfill customers' orders in the most efficient and effective way. Being very much the internal core competency of the firm, a holistic ISCM and understanding of the internal processes and their interdependencies is very important for sense making and identifying opportunities.

Indeed, ISCM is the internal tactical and operational capability of the firm. In a vertically integrated firm, ISCM is the holistic management philosophy and capability because it incorporates the demand and supply information to plan the internal operations in a coherent style. As such, it is for a firm's internal operations what SDNM is for the total demand network. It is a critical part of the SDNM practices set because without the ability to run its own operations, a firm can't synchronize with suppliers and customers or benefit from the inputs it gets through the SRM and CRM processes. Therefore, ISCM allows a firm to connect CRM with SRM, and vice versa, in order to create a responsive, efficient, and effective demand network capable of delivering superior value to the end customer and consequently lead to competitive advantage.

Thus, ISCM benefits greatly from the sensing and learning capabilities. Nonetheless, without ISCM in place, a firm can't effectively benefit from sensing and learning capabilities. Effective ISCM is thus a prerequisite to effective demand network sensing and learning capabilities. It also provides total visibility of internal resources and their potentially valuable combination possibilities which when connected with CRM and SRM processes enables a total system view and synchronization with external value chain processes. In other words, without a holistic and comprehensive

understanding and management of the internal resources and capabilities, a firm can't effectively sense the market for potential opportunities and threats and it can't effectively learn new knowledge because ISCM is required for a firm to be able to understand and run its own business efficiently.

Sensing and learning capabilities take into account the internal capabilities and competences and without the ISCM in place, scanning the environment for valuable resource combinations, market opportunities, or market change effects on the firm can lead to inappropriate conclusions regarding their impact on the firms capabilities and the actions required to respond to opportunities or threats. The ability to learn new knowledge greatly depends on the knowledge position of the firm regarding its own competencies and without a solid knowledge of one's competences, learning new competences and complementing them with existing know-how would be difficult or inappropriate. In addition, quests to create competencies created by combining resources from across the demand network can also fail because without ISCM in place, it would be difficult for a firm to know the value of its resources and the limits of its capabilities and the effect of these new combinations on the other interrelated process.

The information sharing process allows the ISCM to use CRM and SRM. However, as suggested previously, unless the information shared is used by ISCM, SRM, and CRM to plan and execute a coordinated and collaborated demand network effort to increase the efficiency and the effectiveness of the end products and service, there is not much benefit to sharing information (Sahin & Robinson, 2002; Sahin & Robinson, 2005). However, through sharing of critical demand information a supplier

can plan its production capacities and the sharing of critical supplier capabilities' information allows a customer to promise certain service levels to the end customer. As intuitive as it may sound, information sharing is not a common practice among firms. Some fear abuse by the stronger member of the demand network, and some are not able to sort information from the data and lack the infrastructure to share the right information with the right party at the right time. Nonetheless, information sharing affects the ability to gain competitive advantage and thus is a critical part of the strategic and operational SCM capability. Only after sharing the information, a firm can scan for opportunities for improvement across the demand network and explore and learn new knowledge.

This brings us to our first set of propositions based on the above arguments made to link SDNM practices to the sensing and learning capabilities of the dynamic capabilities concept. Indeed, SDNM practices due to their active and holistic management of processes nature can facilitate a more effective sensing capability. The SDNM practices strive to align, collaborate and synchronize the processes and operations spanning the demand network to work effortlessly. Thus by their very nature, they can actively engage with the different partners, which can support the creation of relational and social capital and thus enable the firm not only to access more information from its partners but also absorb that information and knowledge. Hence, the following propositions:

Proposition 1a: The SDNM capability and the SDNM practices can lead to a more effective network wide sensing capability.

Proposition 1b: The SDNM capability and the SDNM practices can lead to a more effective network wide knowledge learning capability (the ability to effectively acquire, assimilate, transform, and exploit new strategic knowledge from the network).

Conversely, the sensing and learning capabilities, along with the other capabilities, can lead to better and more effective SRM. The dynamic capabilities are higher order capabilities that extend, modify and or create lower level operating capabilities. Sensing and learning capabilities are part of the dynamic capabilities' enabling processes and hence can affect tactical and operational capabilities such as SRM and manufacturing processes for example. These two capabilities can help SRM in various ways, the first of which is the scanning and identifying the appropriate suppliers to approach and with which to build a long-term relationship. The sensing capability of the firm also helps to identify the market requirements and the learning capability helps to assimilate these new requirements into the firm's strategy and action. After learning what is needed, the firm needs to plan and implement an action plan to respond to changes and exploit the opportunity.

Again, through the sensing and learning capabilities, the firm searches for the different resources and capabilities needed to better produce a product or provide a service, whether this product exists or is being developed. Also, the sensing and learning capabilities scan both inside and outside the firm across its demand network and beyond for the valuable resources needed to develop a new configuration of resources and capabilities that can create new competences. Hence, effective sensing and learning

capabilities can help a firm better decide which set of suppliers to include in the reduced supply base. Such a strategic decision requires a firm to be knowledgeable of the suppliers' capabilities and be able to assimilate knowledge from them before strategic supplier partnerships can be developed. Product development processes, a topic extensively researched through many lenses, also require a firm to have the learning capability in order to be able to work on joint product development projects with its supplier(s). Thus, the sensing and learning capabilities are critical in identifying which supplier can and should participate in developing the new product.

In addition, using its sensing and learning capabilities, a firm continuously scans the environment for upstream and downstream changes and hence can make a more informed decision regarding the nature of its relationship with its suppliers. Being aware early on of upstream changes affecting one's suppliers' capabilities to meet the firm's requirements clearly benefits the firm and enables it to manage its supply and its relationships with its suppliers in a more effective manner. Therefore, not only does SRM affect the sensing and learning capabilities, but these two capabilities also have an effect on the SRM processes. As SRM processes add depth and breadth to sensing and learning capabilities, these dynamic capabilities significantly affect the process of determining, beforehand, the suppliers which the firm can develop and implement its SRM process with. Furthermore, through continuous and active sensing and learning after the relationship has been established the firm can better determine most suitable suppliers for its future offerings.

Although a firm's CRM function with sensing and learning capabilities can identify the customers it can synergistically serve and hence allow it to approach the customers with value creating proposals, a firm is often approached by the customers, based on the customers SRM processes through their sensing and learning capabilities. Hence, by scanning the environment and sensing opportunities for growth and learning the customers' information, a firm is able to identify the best customers with which it has a chance for establishing synergistic long-term relationships, relationships that the firm nurtures and manages using CRM.

Moreover, even after establishing the relationship, the sensing and learning capabilities are necessary for effective CRM as they facilitate discerning and understanding information accessed from the customers such as POS, forecasts, production plans, and promotional plans. Furthermore, the sensing and learning capabilities enable the CRM to identify how it can better serve the customers' needs and at the same time identify resource combinations that the CRM can then manage. Without having the ability to learn critical knowledge concerning the customers, a firm will have a hard time meeting the customers' demand. The sensing and learning processes of dynamic capabilities can guide the development and application of the CRM capability so that it becomes a tool for competitive advantage and not just a delivery coordination capability.

Furthermore, the ISCM process can be most effective when it integrates knowledge from the SRM and the CRM processes. Therefore, only through scanning the environments, both upstream and downstream, to sense opportunities and or threats, and

through learning from both upstream and downstream sources, ISCM can effectively integrate demand and supply management inside the firm. The sensing capability allows ISCM to identify potential resource combinations, to seize opportunities for improvement by learning from suppliers and customers and from within the firm, and to plan and execute the activities needed in order to create new competences.

Without fully being aware and understanding the customers' needs and the suppliers' capabilities, ISCM won't be able to deliver what the customer wants in the most efficient and effective way. Also, without identifying the consequences of structural and technological changes occurring beyond the direct customer or supplier, ISCM may not be able to adapt appropriately to the new conditions in a timely manner. Sometimes the change can be so dramatic that a firm's core competency is substituted for another or even dropped from the value chain. Thus, effective ISCM is necessary for the sensing and learning capabilities to be useful and effective and so are these two capabilities for efficient, responsive and effective ISCM. The two dynamic capability processes can guide ISCM in both stable and unstable environments by helping identify value creating resource combinations within and across the demand network.

In addition, a firm has to have sensing and learning capabilities in order to be able to identify opportunities from the shared information. And it also needs a learning capability to make sense of the shared information. The sensing capability can identify the information that the firm needs in order to create a new competency, to meet a certain customer's demand, to take into account a supplier's capability and thus to actively seek the required information. Thus, the sensing and learning capabilities can

help a firm decide with whom to share information and how much information to share and what information to seek in order to make the information sharing process more effective and more useful to the other SDNM processes. This brings us to the second set of propositions making the case for adopting dynamic capabilities' processes objectives when designing, developing and using SDNM capability practices.

> *Proposition 1c: The sensing capability leads to better SDNM capability practices processes by helping the firm identify the best supplier and customer with which a firm can develop strategic relationships, and scan for innovative opportunities upstream and downstream throughout the network on continuous basis.*
>
> *Proposition 1d: The learning capability leads to better SDNM capability practices by enabling the firm to learn and absorb critical knowledge from internal and external sources which will improve and guide the SDNM capability.*

4.5.2 SDNM practices and the coordination and integration capabilities

After sensing the opportunities and the threats, a firm needs to then integrate its past experience, the experiences of its partners, and the processes carried-on inside the firm and throughout the demand network so that it can coordinate the resources and capabilities to configure a new competency suitable for addressing the new opportunity or threat.

Integration and coordination capabilities are required in order for the firm to effectively and efficiently combine and deploy valuable resource. More often than not, an individual or a single company does not have all the technology, assets, and know-

how to be able to deliver the complex products demanded by the current day customers in an efficient and effective manner. Therefore, individuals within a functional unit or a firm need to integrate their know-how and coordinate their activities in order to be efficient and meet the customers' demand. By the same token, demand network members need to integrate and coordinate to be able to gain an advantage over rival demand networks. Thus, being able to integrate: 'to bring together or incorporate into a whole', and to coordinate: 'to combine in harmonious relation or action', processes and capabilities from across the demand network are necessary, but insufficient, competencies for gaining and attaining operational competitive advantage.

Moreover, SDNM is an integrating process that ultimately links all the interdependent value adding business processes and functions from different demand network entities and stages into an aligned whole that aims to gain competitive advantage for the demand network and its individual members. SDNM also drives the coordination of primary and supportive value chain processes and activities, within the firm and across the demand network, in order to improve the performance of entire the demand network in the face of competitor chains.

RBV and dynamic capabilities perspectives promote coordination inside the firm for the firm to be able to identify, integrate, combine, configure and reconfigure and deploy resource combinations. SDNM extends the RBV and dynamic capabilities concepts outside the firm to the entire demand network, which has become the new unit of competitive analysis. Note that all the above discussed SDNM practices are necessary for the total SDNM capability and as such, are important elements of the

demand network integration and coordination capabilities. Thus, in the following paragraphs I elaborate on the relationship between the SDNM capability and the dynamic capability's integration and coordination capabilities.

The SDNM capability is an integration and coordination capability that embodies the integration and coordination processes that dynamic capabilities require to integrate, build, combine and reconfigure resources at will. In other words, SDNM is how a firm manages the demand network's resources and capabilities in an integrative and coordinated manner to develop and deliver products and services to the end customer.

The dynamic capabilities literature does not explain how a firm can integrate or coordinate its own activities or the activities that span firm boundaries, in order to use the resources and capabilities it controls or has access to, to create competitive advantage. This is a relevant criticism for both the RBV and the dynamic capabilities perspectives that some scholars have recently addressed (Sirmon & Hitt, 2003; Sirmon et al., 2007). Sirmon et al. (2007) present the resource management process and the components of the resource management model as the means through which the management of the firm can actively use its resources and capabilities to create value for the end customer, gain competitive advantage and create wealth for the owners of the firm.

Their proposed resource management model relates to the SDNM capability as both can be considered tactical capabilities that create, manipulate and deploy unique resource combinations (operational competencies) that create value for the end customer and lead to competitive advantage (Lippman & Rumelt, 2003). They propose the

structuring of a resource portfolio (acquiring, accumulating and divesting resources), the bundling of resources (the process of combining firm resources to create or modify capabilities), and the leveraging of resources (applying the firm's capabilities for value and competitive advantage creation) as components of the resource management process. Moreover, they also propose that "value creation is optimized when a firm synchronizes the processes in and between each resource management component such that the difference between the firm's costs and the price paid by the consumers is optimized" (Sirmon et al., 2007: 274). And this is exactly what the SDNM capability has been posited to achieve in the SCM literature.

SDNM and its practices are involved in all the components of Sirmon et al.'s (2007) proposed resource management model. Whether the resources are inside the firm or diffused in the firm's network, the SDNM capability can facilitate the implementation of each of the components. In fact, SDNM is practically an 'operationalization' of the model because it is involved in each part of the model and also enables the synchronization and coordination within and between each component. Indeed, the coordinating capability as defined by Pavlou and Sawy: "the ability to manage dependencies among resources and tasks to synchronize activities" (2006: 7), is one of the primary goal tasks of the SDNM capability.

From the above discussion, it can be concluded that SDNM is a necessary but insufficient process for the firm to have the integration and coordination capabilities needed to be dynamic and flexible in a network based competitive environment. Having the SDNM capability, by using SRM, CRM, information sharing, and ISCM processes,

can in itself lead to competitive advantage as top corporations such as Dell, HP and Wal-Mart have exemplified. Nonetheless, it is more acceptable to say that effective SDNM capability is a necessary but insufficient condition for sustained competitive advantage. I propose that by integrating the SDNM research with the RBV and dynamic capabilities research, many of the criticisms for the latter two concepts can be dispersed. SDNM is the tool by which management, after sensing and learning of a change, can integrate and coordinate tangible and intangible resources and capabilities in order to create new configurations of operational competencies that better match the new environment. Thus I propose the following:

> *Proposition 2a: In both the vertically integrated and disintegrated firms and in the era of network competition, the presence of an effective SDNM capability is essential for effective integration and coordination capabilities within the demand network.*

Meanwhile, the strategic emphasis on integration and coordination can encourage firms belonging to a demand network (supply chain) to effectively manage their demand networks (supply chains) and collaborate with other demand network members to build and create the SDNM capability so that the entire chain can operate in an aligned, flexible and agile way. Although, the SDNM capability holds much potential, many executives are still hesitant to surrender the control of their operations to a total SDNM function that tries to optimize the entire demand network rather than an individual firm's operations. They fear that the partner will use that control for its benefit without regard for their long-term benefit. Leakage of know-how to competitors is one of the main

reasons for their reluctance in addition to skepticism of supply chain and alliance initiatives in light of their high failure rates in practice.

Adopting a resource-based view of the firm and the dynamic capabilities perspective to seek a sustainable competitive advantage can help individual firms in the demand network understand the need for managing the entire demand network in an integrated manner. Only through managing the critical and key processes throughout the entire demand network in a coherent way can the entire network operate in a synchronized and aligned manner, which will create value for the customers and hopefully lead to competitive advantage relative to other chains.

Proposition 2b: Adopting a dynamic capability perspective of integration and coordination will positively affect adoption and implementation of SDNM processes (SRM, CRM, information sharing and ISCM) across the companies making up the demand network.

4.5.3 SDNM practices and the reconfiguration capability

The ability to sense opportunities and threats, learn from them, and the ability integrate and coordinate different competencies in order to reconfigure the operational competencies is the ultimate goal of dynamic capabilities. Achieving this goal can lead to better applications of the organizational processes that compose a firm's dynamic capability. For example, product development processes, strategic decision making processes, alliance and acquisition routines are all organizational processes that affect the firm's profitability and in the face of dynamic markets, require the manipulation and

reconfiguration of strategic assets in order to create new value creating operational competencies (Eisenhardt & Martin, 2000).

Because the SDNM and its sub processes are critically important for effective sensing and learning capabilities, and effective integrating and coordinating capabilities (the four reconfiguration enabling capabilities), it can be deduced that SDNM is also critically important to the reconfiguration capability. Whether it is an innovative redeployment of current resources, the renewal of existing resources, or the creation of new resources, an effective SDNM capability is the tool by which the reconfigurations processes can be implemented and enabled.

Moreover, because these new configurations should be determined based on environmental changes whether it is customer or supplier related, no effective reconfiguration can take place without tightly connecting with the suppliers and customers. Business processes are interdependent, even if they spread across separate entities, hence, any process redesign's effects on other processes throughout the demand network need to be taken into account, managed and synchronized. This is something that an effective SDNM capability strives to realize. In a way, the SDNM capability is indirectly related to the reconfiguration capability by directly affecting the reconfiguration enabling processes. In another way, it is also directly related to the reconfiguration process. Moreover, the SDNM processes, each individually and together as a total SDNM capability, enable an effective and efficient reconfiguration capability by enabling each of the reconfiguration enabling processes. Reconfiguration processes

require a great deal of coordination and collaboration between different units and entities, which the SDNM capability can help facilitate.

Because the SDNM capability, as a tactical capability, is best situated to connect strategic actions with operational processes, it enables the implementation of the strategy throughout the different levels and functions of the organization. It offers management the visibility of the demand network, from end user to the furthest critical supplier and thus leads to better management of the firm's resources and capabilities. Reconfiguration processes require high levels of coordination and integration with different entities, whether inside the firm or outside, with suppliers, and with customers in order to be completed in a timely and efficient manner and hence seize new opportunities or overcome threats. Consequently I propose the following:

Proposition 3a: SDNM is directly and indirectly related to the reconfiguration capability.

Proposition 3b: Effective SDNM can facilitate a more effective reconfiguration capability.

Constantly practicing the combination and configuration of resources can fine tune the firm's and the demand network's reconfiguration capability while at the same time guide and enrich the SDNM practice as each reconfiguration process involves heavy collaboration and synchronization efforts between different entities, be it internal or external. The reconfiguration capability can thus help build the SDNM capability and also guide the evolution of demand network relationships by identifying the effect of the resource reconfiguration on different partners and managing the relationships

accordingly. Reconfiguration processes might elevate a supplier to a strategic level and drop others. It can also create new customers and or identify new customer processes which the newly configured operational competency can complement to create value and competitive advantage.

The reconfiguration dynamic capabilities process, by affecting the customers, the suppliers and sometimes the business the firm is in, can then also affect the SDNM capability. Not all suppliers and customers are managed with the same level of importance because firms can have many suppliers and customers and investing in a strategic relationship with each one creates a highly complex process that is prohibitive in both time and cost. Therefore, an effective reconfiguration process can help guide the SRM, CRM, ISCM capabilities and the information sharing processes independently and SDNM as a whole. Thus I propose the following:

Proposition 3c: The reconfiguration capability can and should guide the SDNM capability development and how SDNM practices are implemented.

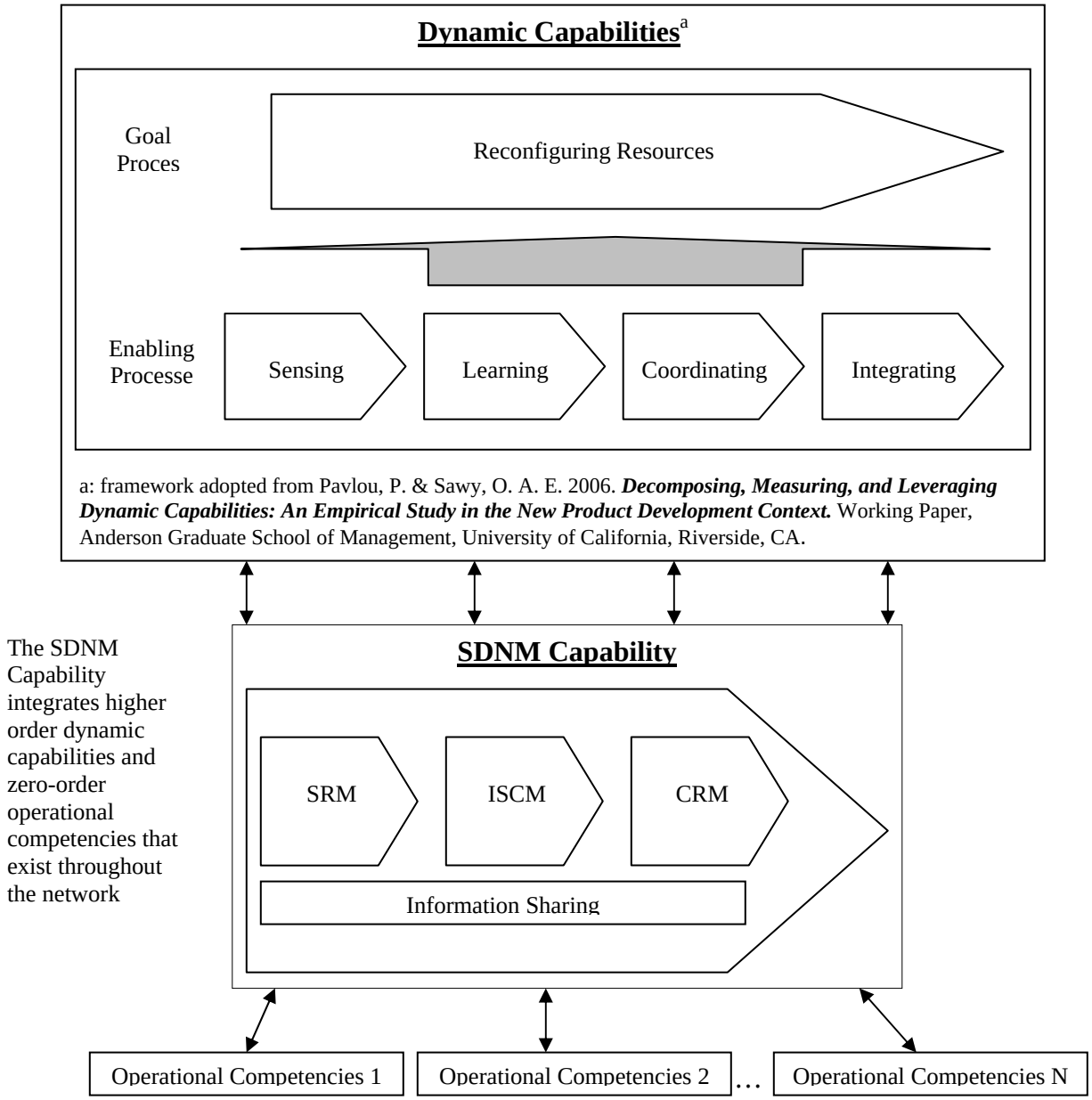
4.6 Concluding Remarks

This brings us to the last part of this chapter, which was devoted to integrating the concepts of SDNM and dynamic capabilities and exploring synergistic relationship between them. Because the dynamic capabilities concept comes from the strategic management literature and SDNM has much of its origins in operations management both areas stand to benefit from this integration. Operations management is not only responsible for implementing the company's strategies but it also provides the feedbacks that help modify and develop more refined strategies. Figure 1 summarizes the

propositions in this chapter and shows how the SDNM capability connects the dynamic capability processes with the network level operational competencies that exist throughout the network.

FIGURE 1

Dynamic Capabilities and the SDNM Capability



SCM can remove much of the tautology criticisms laid against the RBV and dynamic capabilities perspectives while also benefit from the RBV and dynamic capabilities' emphasis on the firm as a bundle of heterogeneous resources and capabilities that need to be managed effectively to attain competitive advantage. Strategic demand network management 'SDNM', provides the network's member organizations a competitive advantage by integrating the strategies, technologies and operations of the network organizations using various SDNM practices. SDNM help identify customer requirements, outline all the processes needed to create value for the customer, whether these processes lay solely within the firm or extend across the network, and help manage the interdependencies between the network firms to create the most efficient, yet effective network.

Because it can help identify, combine, deploy and manage the VRIN resource combinations that the RBV and the dynamic capabilities perspectives promote as sources of sustainable competitive advantage, SDNM both drives and enables the strategy. Also, being able to manage the business operations, inside the firm and across the demand network, in a value creating manner, is the first step toward achieving a competitive advantage. Therefore, without SDNM, it will be difficult for a firm to effectively learn when efficiency is the critical competitive advantage criterion or when agility and responsiveness are the appropriate criteria.

By breaking down SDNM into its processes of SRM, CRM, ISCM and information sharing practices and their sub-processes, I have described how SDNM connects strategy to the operational capability of running the day-to-day operations.

Moreover, as the processes required to combine, to configure and to manage synergistic resource combinations extend across multiple functional units within and across organizations, achieving improvements in cost, time, quality, innovation and other generic competitive strategies, requires a holistic management of the operational interdependencies and complementarities. Without a holistic SDNM approach, firms may not realize their stated strategies in competitive time, cost, or even in terms of end product results.

The dynamic capabilities literature stresses that the ultimate goal is for a firm to continually update, reconfigure and deploy its operational competencies; competencies that better match the environment and lead to operational performance advantages compared to rival firms or chains, which ultimately lead to gaining and maintaining competitive advantage. In this work, I have explicitly connected the SDNM (SCM) capability with dynamic capabilities. I have proposed that it can help achieve the goals of the dynamic capabilities by enabling the processes underpinning dynamic capabilities: sensing, learning, integrating, coordinating and integrating capabilities within the firm and across the network. I also proposed how actively seeking dynamic capabilities can help a firm more effectively initiate, develop and manage its demand network management operations and relationships, i.e. guide the SDNM capability.

In addition, this work tried to integrate the concepts of SDNM and dynamic capabilities in order to present a complete treatment of how firms can manage the resources they control or have access to via the network they are embedded in. Moreover, although some offer SDNM as the magic tool for profitability, SDNM

implementation examples often contradict that claim. However, by integrating the SDNM capability with the strategic management paradigms, a firm will be better prepared to effectively develop and implement SDNM practices that implement competitive strategies, and also to better utilize the SDNM capability for competitive advantages purposes.

In conclusion, SDNM is a capability that spans strategic, tactical and operational levels; thus, it is a useful tool for the RBV and dynamic capabilities strategic management paradigms' quest for attaining and sustaining competitive advantage. Also, because SDNM directly deals with resources and capabilities that exist within the firm and throughout the demand, there is much parallel between it and the dynamic capability construct. In fact, the SDNM capability can be considered a dynamic capability in itself because of the similarities in the processes and objectives, albeit stemming from different origins. Further research on how the higher order dynamic capabilities manipulate the SDNM capabilities and how the SDNM affects and enables dynamic capabilities holds great promise for further integration of the fields of strategic management and operations management. If strategy is the brain of the firm that plans and outlines a mission, the SDNM can be considered as the nervous system that integrates and coordinates the inputs from the hands, the legs and the other senses to create a balanced, synchronized, efficient, and effective firm output, while also providing feedback to the brain for modifying and developing the strategy.

CHAPTER V

ALLIANCE MANAGEMENT CAPABILITY AND SDNM

Answering the call for more integration of insights between strategic management and supply chain management fields (Ketchen & Hult, 2007a), this chapter identifies the similarities and complementarities between the strategic management research on alliances and the supply chain management field. The SCM (SDNM), which has been ignored to a great extent by the strategic management field (Ketchen & Giunipero, 2004), has much to gain from and add to strategic management as both fields are multidisciplinary in nature. Hence, in an effort to integrate the two fields, cases will be made for propositions on how each field affects the other and adds to our knowledge of the other field respectively and of the interactions between them. In doing so, I hope to be able to borrow from organization theory research in order to provide the still developing SDNM knowledge with theoretical underpinnings and to better guide the development of SDNM practices. On the other hand, and according to some, effective SDNM capability has become essential for gaining and sustaining competitive advantage (or competitive parity at least) in the new competitive landscape in which networks compete against other networks. (Cheng & Grimm, 2006).

Although SDNM is a capability that manages the combination process of firm resources with complementary external resources in order to create synergistic collaborative advantage, the existing hype about SCM in the business world has largely been ignored by the strategic management research (Ketchen & Giunipero, 2004).

Nonetheless, I believe that mutually relevant and sometimes identical topics are often addressed in strategic management research using different terminologies and focusing on different levels of analysis: strategic vs. operational. Even though the strategic management field may have not taken great interest in the term SCM, it has however focused on alliances and networks as sources of collaborative advantage. A SCM specialist can easily recognize and relate to the concepts covered in strategic management when it comes to networks and strategic alliance, as the following literature review will show. And this is one of the main objectives of this chapter: to integrate the findings in the two fields in order to enrich both fields simultaneously.

Strategic demand networks are in fact strategic alliances between multiple firms, positioned along different stages of the value chain, and working collaboratively for joint competitive advantage. As such, incorporating the extant knowledge on alliances, developed through extensive research on the topic in the strategy literature, into the SDNM research can greatly benefit the field of SDNM. Moreover, SDNM as a means of tactically and operationaly managing alliances should provide useful tools for effective alliance management capability, which is a critical capability for alliance success (Ireland et al., 2002; Kale et al., 2002; Spekman et al., 1998b). Therefore, a literature review of alliances is presented first in order to synthesize the alliance research and identify the perspectives that are later applied to SDNM.

5.1 Strategic Alliances Literature Review

The decision to make or buy has been at the heart of strategy research because of its direct relation to competitive advantage and its consequence on a firm's future

resources and capabilities (Fine & Whitney, 1996; Jacobides & Billinger, 2006; Leiblein, Reuer, & Dalsace, 2002; Venkatesan, 1992; Walker & Weber, 1984). This quintessential decision has been analyzed using various theoretical perspectives, starting with Transaction Cost Theory (TCT) which essentially posits that when the cost of an external transaction is higher than the cost of producing internally, the activity should be performed inside the firm (Coase, 1937; Williamson, 1975, 1985). The transaction costs are not limited to the manufacturing costs but include other costs such as the cost of searching for the supplier(s), negotiating the details, monitoring performance, and other costs comprising the total cost of a transaction (Williamson, 1975, 1985).

According to TCT, opportunism, bounded rationality, uncertainty and small numbers bargaining (lack of costless alternative suppliers) are the main drivers for vertical integration instead of arm's-length market transactions (Williamson, 1985). However, when it is not effective to internalize an activity, or when tacit resources are involved, or when only a specific firm asset is desired, alliances are preferable to full acquisition and/or arm's-length market transactions (Collins & Hitt, 2006; Rothaermel et al., 2006). Hence, TCT concludes that when alliances are capable of minimizing transaction costs (searching, negotiating, contract writing, monitoring and enforcing contracts) they are more efficient than markets and will be the organizational form of choice (Jarillo, 1988). Of course, alliances have significant coordination costs that, because of the need to coordinate in an integrative manner with independent firms the complementary interfirm tasks and processes, must be minimized and controlled (Dyer, 1997; Gerwin, 2004; Gulati, 1998).

Another theory that has been widely used to explain the make or buy decision is the Resource-Based View (RBV) (Barney, 1999; Combs & Ketchen, 1999; Eisenhardt & Schoonhoven, 1996). Its main premise is that a resource that is valuable, rare, inimitable and non-substitutable (VRIN) can lead to competitive advantage (Barney, 1991; Wernerfelt, 1984). It also proposes that firms are heterogeneous in their resources and capabilities endowments and should seek to develop or create unique resource combinations that can be deployed in pursuit of competitive advantage (Penrose, 1959). However, because a VRIN resource that can lead to competitive advantage will likely not be readily available in the factor market (market for production inputs: financial, technological, human or knowledge), the firm adopting a RBV, has to either develop it internally or be able to identify the complementarity value of a resource available in the market with its resource better than its competitors (Barney, 1986). Therefore, access to, and effective use of network resources, especially tacit ones, is critical for the ability to combine them in a unique VRIN resource combination capable of attaining competitive advantage.

Hence, incorporating a RBV when making the make or buy decision has critical implications for the competitive capabilities of the firm (Das & Teng, 2000a). Above that, a RBV of competitive advantage directs a firm to seek alliances with other firms whose resources can be combined with its own in order to configure a VRIN resource and capability whose value is unique and superior to other combinations (Das & Teng, 2000a). When each entity along the value chain specializes in its core competency, great benefits can be obtained by synergistically combining these specialized competencies

(Prahalad & Hamel, 1990). Therefore, access to these specialized resources, especially tacit knowledge, is a critical reason for alliance formation because alliances are the "best means of transferring tacit managerial and technological capabilities" (Hitt et al., 2000: 462).

Another theory that is also relevant when addressing alliance formation reasons and alliance evolution is the social (capital) network theory (Gulati, 1995a; Inkpen & Tsang, 2005; Koka & Prescott, 2002; Oliver, 1997; Tsai, 2000; Tsai & Ghoshal, 1998; Uzzi, 1997). Social capital is "the relational resources attainable by individual actors through networks of social relationships" (Tsai, 2000: 927). According to this theory, engaging and effectively managing social relations with alliance partners in order to create a social capital, especially trust, can lead to significant reductions in transaction costs and can provide access to valuable tacit knowledge (Lin, ; Uzzi, 1997). Indeed, the density and structure of a firm's network of alliances and the firm's position and its direct and indirect ties play an important role in deciding with whom an alliance is established and whether it will be successful or not (Adler & Kwon, 2002; Ahuja, 2000b; Burt, 1992; Granovetter, 1985; Inkpen & Tsang, 2005; Uzzi, 1997; Walker, Kogut, & Shan, 1997).

Nonetheless, adopting more than one theory to explain strategic alliance formation ('strategic outsourcing'), alliance management capability, and the abilities of the alliances managers to identify opportunities and mobilize the firms' resources in order to exploit these opportunities is critical for a better understanding (Ahuja, 2000a;

Holcomb & Hitt, 2007). The combined different perspectives will better explain how alliances should be managed for value creation.

Verily, in this hypercompetitive global economy, many firms lack the ability to internally develop critical resources and capabilities that lead to sustainable competitive advantage (D'Aveni, 1994). And at the same time, the uncertainties often present forbid them from acquiring these critical resources through an arm's-length trade (D'Aveni, 1994; Volberda, 1996), thus making ubiquitous the observed phenomenon of strategic alliances (Gulati, 1998). Strategic alliances are created to maximize the partnership's value creation opportunities and minimize the transaction cost of coordination and cooperation through contracts (Dyer, 1997; Hitt, Ireland, & Hoskisson, 2005). Long gone is the era when the likes of Ford Motor Company, especially in its early days, owned the entire value chain from iron ores to distribution outlets. As the products become increasingly complex, no firm has the knowledge, the resources and the capabilities to be the best in every process making up the value chain (Clark & Fujimoto, 1991; Dyer et al., 1998; Handfield & Bechtel, 2002; Handfield & Nichols, 2002; Prahalad & Hamel, 1990). The focus on core competencies in times of competency-destroying technological uncertainties and increasing product complexities have further encouraged the common hybrid organizational form of strategic alliances and strategic networks (Gomes-Casseres, 1994; Gulati, 1998; Gulati, Nohria, & Zaheer, 2000; Inkpen, 2001). This is especially true in fast-cycle markets where technological breakthroughs render products obsolete in record short times making the go-at-it-alone policy very risky.

A strategic alliance is an example of cooperative strategies between two or more firms that share resources for the benefit of all partners (Hitt et al., 2000; Ireland et al., 2002; Jarillo, 1988). Many definitions of strategic alliances can be found in the literature. One such definition is "a strategic alliance is a cooperative strategy in which firms combine some of their resources and capabilities to create a competitive advantage" (Hitt, Ireland, and Hoskisson, 2005: 271). Or, "strategic alliance is a close, long-term, mutually beneficial agreement between two or more partners in which resources, knowledge, and capabilities are shared with the objective of enhancing the competitive position of each other" (Spekman et al., 1998: 748). Alliances can create value based on the firm's alliance management experience and the firm's unique ability to create value through alliances (Anand & Khanna, 2000).

Strategic alliances have three important characteristics. First, the two (or more) firms forming the alliance remain independent. Second, alliance members are mutually interdependent and thus are vulnerable to each other (Parkhe, 1993). Third, because partners remain independent, there is some risk that each member faces due to the uncertainty as to what the other party might do opportunistically when contigencies arise (Powell, 1996).

Equity joint ventures, licensing arrangements, shared product development projects, shared purchasing and manufacturing and long-term buyer-supplier partnerships are all forms of alliances. Moreover, alliances form between two or more independent firms to face competition from other alliances or other supply chains, to mitigate uncertainty and risk, and to create a greater value than each firm can create

independently by complementing each other's resources and adding value along each level of the supply chain (Gomes-Casseres, 1994). These strategic networks also provide access to unique resources and capabilities, markets, legitimacy and reputation, economies of scale and scope, financial capital, technology and management knowledge (Alvarez & Barney, 2001; Bleeke & Ernst, 1991; Dyer, 2000; Gulati, 1998; Gulati et al., 2000; Hitt et al., 2000; Ireland et al., 2002; Kale et al., 2002).

A common type of vertical alliances, especially in supply contracts is the none-equity strategic alliance which is defined as "strategic alliances in which two or more firms develop a contractual relationship to share some of their unique resources and capabilities to create a competitive advantage" (Hitt et al., 2005: 272). In addition to that, some vertical alliances are of the equity strategic alliance type in which two or more firms own different percentages of their suppliers or customers, e.g. Toyota first tier keiretsu suppliers alliance. Moreover, a third type of strategic alliances is the joint venture where two or more firms create a legally independent firm. Vertical complementary strategic alliances are alliances in which each firm in the alliance uses its resources to add value to its supplier's output along the value chain (network) until the end product is sold to the customer (Hitt et al., 2005). While horizontal complementary strategic alliances are alliances in which firms from the same value chain stage share their capabilities in complementary ways (Hitt et al., 2005).

5.2 Strategic Alliances and Competitive Advantage

Complementary strategic alliances, especially vertical ones, have the greatest potential for creating a sustainable competitive advantage (Chung, Singh, & Lee, 2000;

Garai, 1999; Harrison et al., 2001) because the opportunity to learn and improve processes increases under such a setting (Dussauge, Garrette, & Mitchell, 2000). Synergy is created when two firms combine their complementary resources in a unique way that creates more value than can be created by each firm independently (Harrison et al., 1991). However, the creation of synergy between two independent firms requires a great deal of coordination. And it is in these complementary strategic alliances that I propose the SDNM capability to be a critical success factor and an effective source of synergy.

These alliances are formed to perform a joint task by pooling resources unavailable to each firm individually. Also, they are created for several other reasons, among which are: to reduce products' development and launch times, i.e. time to market, to gain economies of scale by pooling economic activities such as purchasing and distribution, to reduce risk and uncertainty, to establish legitimacy, to access knowledge or resources, and to create synergy by combining complementary resources (Hitt et al., 2001c; Inkpen, 2001; Ireland et al., 2001; Stuart, 2000). Moreover, some alliances are formed to mimic firms that occupy the same niche in which they compete (Garcia-Pont & Nohria, 2002), and based on social and strategic relationships that produce embeddedness, facilitate better partner selection decisions and enforce efficient control of partner behavior (Gulati, 1998).

According to TCT, transaction cost considerations seek to determine the most efficient organization form (Coase, 1988; Williamson, 1975, 1985). Whether the competitive strategy is cost based and/or differentiation based (Porter, 1985b), lowering

the transaction costs is a necessary condition for an effective strategy to produce a competitive advantage. Therefore, from a TCT perspective, managing the strategic alliance efficiently in order to minimize transaction costs will certainly have a positive effect on the success chances of strategic alliances (Ireland et al., 2002; Kale et al., 2002; Spekman et al., 1998b).

On the other hand, from an RBV of the firm, alliances provide access to external resources and the ability to develop new resources with alliance partners (Ireland et al., 2002). The access could be to resources, such as information, know-how, and/or markets which when combined with the firm's resources in a synergistic and complementary manner can create VRIN resource and thus produce value for the end customer and lead to competitive advantage (Hitt et al., 2001c; Ireland et al., 2002). In the knowledge-based view (KBV) of the alliance, which is an extension of the RBV, access to valuable knowledge is critical to a firm's ability to adapt to changing environment conditions by exploiting existing knowledge or exploring new knowledge to create new sources of competitive advantage (Grant & Baden-Fuller, 2004).

This process of access to valuable resources and the ability to manage and utilize this access to complementary resources in order to exploit current resources and knowledge or in order to create new resources and knowledge is indeed critical to competitive advantage (Inkpen & Dinur, 1998) given the diffusion of knowledge and resources needed for competitive advantage. Therefore, from an RBV, resource accessing alliances must be effectively managed in order to realize the competitive advantage objective (Ireland et al., 2002). And in this chapter, an attempt will be made

to show that SDNM and SDNM practices are critical for an effective and successful alliance management capability.

Unfortunately, although strategic alliances have gained popularity as means for creating competitive advantage, many alliances continue to fail (Park & Ungson, 2001; Parkhe, 1993). According to TCT, cooperation between two independent firms is more difficult than between two units of the same organization (Park & Ungson, 2001; Parkhe, 1993). Alliances also fail due to lack of trust between the partners, due to failure in acquiring the tacit knowledge, due to lack of contract specificity, due to power differences between non-equal partners, and due to free riding and opportunism. Other reasons for alliance failure include but are not limited to "inflexibility in management of the alliance, breakdowns in trust, problems with information exchange, excessive partner conflict, lack of management continuity and different partner expectations" (Inkpen, 2001: 416).

Because of the high failure rates (Bleeke & Ernst, 1995; Kogut, 1988), some argue that alliances are rarely a source of sustainable competitive advantage because competitive and coordination costs limit the sustainability of an effective alliance, hence making the alliance transitional rather than a stable organization for competitive advantage (Porter, 1990a; Porter, 1990b). Moreover, Bleeke and Ernst (1995) propose that unless the alliance is between two complementary equals, it will most probably dissolve into a sale of one to the other or to a third party. Even in the case of complementary equals, much coordination and effective management of the alliance is required to maintain and develop a fruitful relationship.

From the above discussion we can deduce that the mere formation of an alliance will not automatically lead to competitive advantage, in fact the initiative will most likely fail if not managed effectively. Objective and incentive conflicts, transaction costs, cultural differences, interpersonal conflicts, lack of trust, lack of effective governance, failure of knowledge sharing, and coordination and integration difficulties can all lead to alliance failure (Das & Teng, 2000b; Dyer, Kale, & Singh, 2001; Hitt et al., 1997; Inkpen, 2001; Kale et al., 2002; Kale, Singh, & Perlmutter, 2000; Khanna, Gulati, & Nohria, 1998). Hence, aligning incentives in order to pursue mutually beneficial policies is critical to alliance success (Lee, 2004; Narayanan & Raman, 2004). Developing trust between alliance partners based on process capability and as a result of social capital can be a powerful incentive for removing potential conflicts between the alliance partners (Bowersox, 1990; Inkpen, 2001). Trust can also minimize transaction costs and lead to better sharing of knowledge and resources and consequently can lead to an alliance-based competitive advantage (Barney & Hansen, 1994).

Dynamic capabilities enable a firm to integrate, combine, and configure or reconfigure its resources (tangible and intangible) and the resources to which it has access in order to maintain competitive advantage in the face of changing market conditions (Teece et al., 1997). Therefore, alliance management capability is considered a dynamic capability because it requires resource integration such as in product development routines between complementary alliance partners, or resource reconfiguration such as in resource transfer, replication and allocation between the alliance partners, and/or resource gain and release such as in knowledge creation and

application through alliances (Eisenhardt & Martin, 2000). In the previous chapter the relationship between dynamic capabilities and SDNM was explored in order to set the stage for this and the following chapter. In this chapter the relationship between alliance management capability in specific and SDNM practices is explored.

A firm can maintain competitive advantage when, through strategic alliances, it is capable of coping with environmental uncertainties, minimizing transaction costs and maximizing transaction value while proactively adapting to changing conditions (Dyer, 1997; Ireland et al., 2002). Like SDNM, alliance management capability involves many tacit elements and can't be explicitly specified, thus making it a differentiating capability that can lead to sustainable competitive advantage (Dyer et al., 2001). Therefore, proactively managing the alliance relationship, through an alliance function, holds great potential for lowering transaction cost, enabling effective resource exploitation and exploration, leveraging previous alliance experiences and as a result leading to competitive advantage (Dyer et al., 2001; Ireland et al., 2002; Kale et al., 2002; Sarkar, Echambadi, & Harrison, 2001).

As networks substitute individual firms as units of competitive analysis, especially in complex and knowledge-intensive products' markets, a great deal of investment will be required in relational intangible assets in order to enable collaborative coordination, align incentives and build trust among the alliance partners and consequently generate relational rents and competitive advantage for the network (Dyer & Singh, 1998). A firm's position within the network and its strong and/or weak ties with network members are often critical determinants of the firm's ability to gain

valuable knowledge, and its flexibility and adaptability (Ahuja, 2000b; Burt, 1992; Granovetter, 1985; Uzzi, 1996; Uzzi, 1997; Uzzi, 1999). Strong ties with network members create reliability while weak ties create flexibility (Burt, 1992; Granovetter, 1985). And the location of the firm within the network filling a structural hole by connecting two otherwise unconnected firms provides it with the ability to generate rent from this connection, i.e. Toyota and how it connects and benefits from its suppliers through the Toyota supplier association (Dyer, 1996b).

Moreover, as customers demand more customized and differentiated products, the need for specialization and division of labor increases. And so do the coordination and communication costs, which create an incentive to vertically integrate. However, as large vertical organizations have realized in recent history, a purely vertical integration structure for the wrong reasons can be a liability because it can reduce competitiveness, innovation, adaptability and flexibility. On the other hand, in arm's-length transactions, the partners lack the motivation and dedication to make alliance specific investments or share tacit knowledge necessary for a collaborative advantage that can lead to complex differentiated products (Dyer, 1996b; Dyer et al., 2001).

As a result, the hybrid alliance and network forms have emerged as answers to the disadvantages of both vertical hierarchies and arm's-length relationships, derived mainly by advancements in information technology, increased knowledge and product complexity and increased customization of demand (Dyer, 2000). Indeed, alliances can lead to competitive advantage if exploited correctly to create synergy (Ireland et al.,

2002). The above discussion emphasizes the importance of developing strategies and tools to manage the alliance, which will be covered in the next section.

5.3 Alliance Management Capability Activities

The greatest source of competitive advantage through alliances lays in exploiting complementary assets via interfirm cooperation (Harrison et al., 2001; Rothaermel, 2001), even if the partnering firms differ in size (Alvarez & Barney, 2001). Therefore, to realize a competitive advantage requires managing the complementary resources to achieve synergy. The effective management of the alliance relationship, in other words its alliance management capability, can be a source of competitive advantage (Dyer & Singh, 1998; Rothaermel & Deeds, 2006; Srinivasan & Brush, 2006). And according to Dyer (2000) it is when firms create dedicated assets, create trust and effectively manage the knowledge sharing process throughout the extended enterprise (demand network) that the alliance can create collaborative advantage. Moreover, Dyer et al. propose that a dedicated strategic-alliance function creates value by performing "four key roles: it improves knowledge-management efforts, increases external visibility, provides internal coordination, and eliminates both accountability problems and intervention problems" (2001: 38).

Because dedicated assets are specialized to a particular relationship and have lesser value outside that relationship, they carry a large hold-up risk and are not desired in an arm's-length relationship (Williamson, 1985). However, specialized assets, whether location specialization, physical asset specialization or human specialization, can lead to competitive advantage if they are managed effectively because they lead to

higher quality, better communication, and lower costs (Dyer, 2000; Dyer & Singh, 1998; Song & Di Benedetto, 2008; Williamson, 1985).

Site specialization, defined as investing in a facility close to a customer, enables more face-to-face meetings, better communication and lower transportation costs (Dyer, 2000). Physical asset specialization, in the form of machinery, processes or systems can increase product differentiation and quality (Dyer, 1996b). And human specialization which also refers to the alliance specific know-how developed by the individuals within the alliance firms, helps build common languages, and overlapping knowledge bases which facilitate the sharing of the alliance related tacit knowledge through social networks (Dyer, 2000; Lane & Lubatkin, 1998). Individuals accumulate experience regarding how the two firms work together, develop a specialized language, and create relational capital among the two firms which in turn leads to higher levels of trust, which is the most important conduit for tacit knowledge creation and transfer (Collins & Hitt, 2006; Dyer, 2000).

The effective management of existing knowledge and accessing and learning valuable knowledge throughout the alliance and the network can be an effective source of greater customer value through product differentiation and hence competitive advantage (Dyer & Nobeoka, 2000; Grant & Baden-Fuller, 2004; Hult et al., 2006; Inkpen, 1996; Inkpen & Tsang, 2005; Kogut, 2000; Kotabe et al., 2003; Mowery, Oxley, & Silverman, 1996). And this is especially true for specialized physical assets because partners develop idiosyncratic competencies operating and using these assts.

Although many consider the knowledge-based view of the firm to be a mere extension of the resource-based view of the firm since knowledge is after all a resource, KBV has gained popularity in recent years. The proponents of this view claim that it is the knowledge (know-how) that is a core source of competitive advantage for a firm or an alliance network (Conner & Prahalad, 1996; Grant, 1996b, 1996a; Grant & Baden-Fuller, 2004). It is the knowledge of how to integrate, combine, configure, and deploy the different resources available to the firm that can lead to sustainable competitive advantage (Grant, 1996a). The role of knowledge-management has only become more critical in the hypercompetitive global market era where customers demand more differentiation of increasingly complex products (Prahalad & Ramaswamy, 2002, 2004a, 2004b). And it is because of this complexity that rarely a firm has all the knowledge necessary to continually develop a VRIN product or service that results in a sustainable competitive advantage (Araujo, Dubois, & Gadde, 1999). Therefore, firms are forced to collaborate with other firms in order to access knowledge critical for the creation of a VRIN resource and capability.

As such, identifying, accessing and sometimes absorbing the VRIN knowledge, especially the tacit knowledge, residing within the alliance network and even outside the network is a critical competitive capability (Collins & Hitt, 2006). More specifically, "how effectively and efficiently partners develop, transfer, integrate, and apply knowledge" determines an alliance's success (Ireland et al., 2002: 436). Besides, a firm's knowledge base, among other factors, determines its absorptive capability which is the ability to absorb and integrate new knowledge and apply it successfully toward

customer value (Cohen & Levinthal, 1990). Therefore, the alliance network can be the source of valuable knowledge and information that can lead to supernormal profits, also called 'relational rents', which are the 'super-profits' generated due to the alliance and network relationships and not attainable by individual firms independently (Dyer & Singh, 1998; Gulati, 1999). Emphasizing the value of knowledge through alliance networks, Gulati (1999) and Dyer and Hatch (2006) consider the valuable knowledge acquired via the alliance network as the most critical network resource.

On the other hand, searching for the right partner to establish a long-term alliance, cooperating and coordinating interfirm activities in order to create collaborative advantage, and monitoring and measuring performance accounted for a significant portion of the economic activity in the U.S. economy in the 1990s (Butler et al., 1997). One could reasonably assume that these costs have increased in proportion to the growth in outsourcing and alliance creation rate (North, 1990). These transaction costs can determine the competitive advantage potential of the alliance and lowering them is sometimes in itself a source of competitive advantage according to the TCT.

Moreover, a virtue that has proven to lower transaction cost (Barney & Hansen, 1994; Gulati, 1995b), promote specialized assets' investments (Dyer, 1996b; Dyer & Hatch, 2006), and encourage and lead to superior knowledge sharing quality (Clark & Fujimoto, 1991), is trust between the alliance network partners (Dyer, 2000). Interfirm trust is the confidence in the partner's good intentions, in his interest in mutual benefit, and that the partner will not abuse the relationship for its advantage at the expense of the other(s). In other words, it is the confidence in the partner firm's process capabilities to

deliver on its promises and confidence in that the partners will not adopt an opportunistic behavior at the expense of the other trusting partners even if it finds it more beneficial to do so (Barney & Hansen, 1994; Ring & Van De Ven, 1992). Moreover, Dyer (2000) defines interfirm trust as a latent construct based on three factors: reliability of performance, i.e. 'process-based trust', fairness of treatment and profit residual allocation, and goodwill of not behaving opportunistically when partner is in a vulnerable position.

Alliance networks that actively seek to build trust, which interacts with specialized asset investments and knowledge sharing routines, can create a collaborative advantage (Dyer, 2000) because the three constructs mutually support one other. Alliance contracts have proven to be incomplete and unable to predict all future contingencies and therefore are unable to engender flexibility, longevity and sustainable success for the alliance on their own. In fact, alliances should be flexible and able to endure divergence from initial expectations to be successful (Bleeke & Ernst, 1991). As the firms specialize and outsource, transaction costs along with production costs comprise an increasing portion of the overall value chain costs. Thus, lowering transaction costs has become critical to compete via cost. And trust has clear implications to lowering the transaction cost elements listed above. This is especially true for trust's role in promoting contract adjustment flexibility and engendering a long-term cooperative relationship beyond typical contract durations (Luo, 2002b, 2002a).

Trust, based on process reliability, interpersonal relationships and social capital, also promotes the sharing of proprietary knowledge (Uzzi, 1997). Sharing of such

proprietary information gives partners a clearer view of a partner's costs, technology, and processes which leads to better planning and allocation of resources and capacities in order to match the supply with demand efficiently and effectively. As previously noted, specialized assets improve the quality, speed, cost, and differentiation of the products by enhancing the productivity of the alliance network (Dyer, 1996b; Parkhe, 1993). However, in order for a supplier, for example, to make a dedicated investment in a differentiating asset that is only valuable to a specific customer, the supplier has to trust that the customer will not behave opportunistically or renege on the deal. Hence, engendering trust between strategic alliance partners is critical to a successful alliance (Dyer, 2000; Dyer et al., 2001; Dyer & Nobeoka, 2000).

After the need for certain capabilities, which are necessary for current and future competitive advantage but are not available in-house, is identified, decisions regarding the scope of the desired alliance to be sought should be made early on in order to maintain the focus and limit the complexities of the relationship (Khanna, 1998). Nonetheless, alliance partnerships must maintain the flexibility to adapt to changing conditions and have the ability to identify and exploit new uses for complementary resources beyond the original scope. This can clearly be enabled by an SDNM orientation and through SDNM practices because within SDNM, people from different functional units work together, are exposed to, and understand the interdependent interfirm processes (Gulati, 1998; Gulati et al., 2000; McCarter & Northcraft, 2007) to integrate functions and also the entire network (Ellram & Cooper, 1993). Thus, enabling

them to understand how different processes, across firms, fit together and consequently make them best situated to identify new opportunities and new applications.

Another key decision, especially after determining the desired alliance's scope, that affects the success chances of the alliance, is the selection of the alliance partner (Hitt et al., 2000; Ireland et al., 2002). However, recently Li et al. (2008) have found that the alliance scope and partner selection decisions are not sequential but in fact the partner selection can affect the scope, especially when the alliance innovation goals are radical. Firms not only chose partners with resources that complement theirs but also those who do not the focal firm's valuable resources (Li et al., 2008). The partner selection process should be carried out in a diligent manner considering all relevant issues beyond the traditional view of short-term costs. After that, once a network is launched, not all network members deserve equal attention and/or same level of management time dedication; instead a firm has to classify its suppliers and customers into segments (Dyer et al., 1998; Ketchen & Hult, 2007b). Suppliers providing strategic inputs, which are high-value inputs critical for end-product differentiation, require more active management than suppliers providing necessary but non-strategic inputs (Dyer et al., 1998).

Indeed, the strategic inputs in a complex product require extensive amounts of coordination which is further facilitated by dedicated assets and knowledge sharing routines, especially for reciprocally interdependent processes (Krause, Handfield, & Tyler, 2007). This coordination requirement thus demands of the firms involved in the transaction to develop a strategic partnership and multiple functional interfaces and

boundary spanners who work as orchestrators or integrators to bring about seamless coordination (Bitran et al., 2007; Parker & Anderson, 2002). Because of the significant bottom-line effects of strategic alliance partners, these alliances need effective management and can't be treated as mere arm's-length transactions.

Aligning the incentives and creating a collective identity is another critical task that alliance managers must work to realize (Lee, 2004; Narayanan & Raman, 2004). Objectives' alignment and shared identity lowers transaction costs, enables superior knowledge sharing, and facilitates coordination (Kogut & Zander, 1996). This collective identity also leads to social capital and an embedded logic of exchange, in which trust is the primary mean of governance facilitating better collaboration, economies of time, joint problem solving, Pareto improvements in 'allocative' efficiency (which is the allocation of resources and capacities in order to efficiently meet the demand), and complex adaptation (Uzzi, 1997).

Certainly, when authority, identity, justice, and boundary spanners come together, a climate of trust and power emerges in the network (Ireland & Webb, 2007b). Such a climate is necessary for the creation of 'cultural competitiveness' which leads individual network members to act in the best interest of the network and enable the network to identify and fill market gaps more efficiently than other networks (Hult, Ketchen Jr., & Nichols, 2002; Ireland & Webb, 2007b). Nonetheless, creating collaborative advantage takes time as the benefits of a strategic partnership may not materialize immediately. Verily, collaborative advantage is only possible when each firm within the network realizes and accepts the interdependencies between the network

firms, chooses the right partner(s), manages the relationship to align the objectives, and effectively coordinates the interfirm processes (Dyer, 2000).

The alliances management process progresses through several stages and is a continuous decision making process (Das & Teng, 1997). Although Das and Teng (1997) divide the alliance lifecycle into seven stages, Dyer et al. (2001) and Kale et al. (2002) propose five almost identical stages starting with the alliance planning phase and ending with the termination phase. In their alliance planning phase, the need and value chain analysis are used to determine whether to make or buy through an alliance with another value chain member. In the second phase, in which partners are screened, assessed and selected, cultural, managerial and technological fits are analyzed. Third, in the alliance negotiation phase, the alliance contract, metrics, and structure are finalized. In the forth phase, after the alliance is launched, how the alliance is managed in order to build trust, establish knowledge sharing and communication routines, invest in specific assets and jointly tackle problems determine the alliance's success and/or termination. In the last phase, alliances are evaluated based on alliance management results and termination or continuation decisions are made.

In fact, Dyer et al. (2001) and Kale et al. (2002) found that firms establish dedicated alliance functions to capture and codify alliance management know-how in order to successfully manage each of the following alliance lifecycle phases: 1) 'Alliance Planning', 2) 'Partner Selection', 3) 'Alliance Negotiation', 4) 'Alliance Management', and 5) 'Alliance Termination' (Kale et al., 2002: 763). Clearly SDNM, through its active management of network spanning operations, can play a key role in

each phase and hence should be an essential part of any dedicated alliance function. In this chapter, SDNM will be incorporated into the alliance management capability in order to bring about collaborative advantage. The SDNM capability as shown in previous chapters is concerned with supplier selection and the management of interfirm processes and ties in order to seamlessly integrate supply and demand. It actively manages the network relationships and interdependencies scanning for new opportunities for improvement or innovation.

The interfirm ties can be sources of new ideas, information, and opportunities and hence account for differences in the acquisition of competitive capabilities between firms (McEvily & Zaheer, 1999; Rungtusanatham et al., 2003). These idiosyncratic linkages built around relation-specific investments lead to productivity gains and consequently create relational rents because they enable sharing tacit know-how (Asanuma, 1989; Dyer, 1996b; Dyer & Singh, 1998). Since the concept of division of labor came about, it is believed that firms need to develop a core competency and a specialization in order to produce unique products and generate 'rents' (Amit & Schoemaker, 1993). Therefore, to seek competitive advantage it has become necessary to work in conjunction with different specialized partners and often the firm's ability to gain and sustain competitive advantage depends on its suppliers and customers capabilities (Afuah, 2000). Not only that, but supply chain (demand network) glitches, defined as the failure of matching supply and demand, due to ineffective supply chain management can have grave effects (up to 18%) on a firm's stock price (Singhal & Hendricks, 2002) and its success.

Thus, effective management of the strategic alliance relationship is shown to be very critical for the alliance's success. And, from Dyer (2000), Dyer et al. (2001), and Kale et al. (2002) the following, critical for collaborative advantage, activities are identified: 1) the creation of dedicated assets within the network, 2) effective knowledge management, and 3) the creation of trust. Also, Dyer and Singh (1998) propose 1) 'Interfirm Relation-Specific Assets', 2) 'Interfirm Knowledge-Sharing Routines', 3) 'Complementary Resource Endowments', and 4) 'Effective Governance' as determinants of relational rents (alliance-based competitive advantage). The importance of dedicated assets, knowledge management and trust were briefly covered above. Below I elaborate further on the Dyer and Singh's (1998) relational rent determinants.

5.3.1 Interfirm relation-specific assets

For such alliance partnerships to be able to gain and sustain competitive advantage, they often require investments in dedicated assets that are specific to the partner. Although avoided in arm's-length transaction because of their high transaction costs and risks (Klein, Crawford, & Alchian, 1978; Williamson, 1985), effectively investing in a relation-specific asset is a critical alliance management capability. Such assets can create relational rents because they lead to the following: larger exchange volumes that make partners more important to one another, long-term alliance relationship objective is adopted, and quality and productivity improvements are made because of repeated joint problem solving efforts based on the specific assets (Clark & Fujimoto, 1991; Dyer, 1996b; Dyer & Hatch, 2006; Dyer et al., 2001; Dyer & Singh, 1998).

5.3.2 Knowledge sharing

Knowledge can also be an effective source of competitive advantage (Grant, 1996a), but most firms do not have the knowledge required to be superior in every stage of the value network and hence accessing and sharing the diverse knowledge residing within the network can provide it and the network with more opportunities for learning and value creation (Grant & Baden-Fuller, 2004; Inkpen, 1996). Additionally, the source of knowledge in many industries is no longer the individual firm but the network (Contractor & Lorange, 2002; Powell, Koput, & Smith-Doerr, 1996). And networks, within which knowledge is able to transfer and be shared between the different members in a more effective way, will lead the innovation race compared to networks were knowledge is less effectively shared (Von Hippel, 1988). And unless the firm is able to learn from its partners it will actually endanger its long-term independence, its benefits from joining the alliance and eventually its competitiveness (Hamel, 1991).

Nonetheless, the process of sharing the knowledge with the network members can't be left to develop haphazardly, instead, its evolution and implementation must be, to some extent, managed actively in order to identify and develop unique combinations of the knowledge and create new specialized knowledge, while protect proprietary knowledge at the same time (Dyer & Hatch, 2006; Dyer & Singh, 1998; Grant, 1996b; Kale & Singh, 2007; Kale et al., 2000). Investment in information sharing systems such as Enterprise Resource Planning (ERP) and joint problem solving, through which explicit information is shared, is the first step in enabling the transfer of the more tacit,

difficult to codify know-how (Grant, 1996a; Grant & Baden-Fuller, 2004; Kogut & Zander, 1992).

Know-how is often path-dependent and the ability of the partner to absorb and benefit from the access to this know-how largely depends on the focal firm's absorptive capacity, which is partly based on its knowledge base (Cohen & Levinthal, 1990) and that of the partnering firm's, and the overlap between the two knowledge bases. In addition, knowledge absorption also depends on the similarities between the partnering firms in terms of organizational structures and dominant logic (Lane & Lubatkin, 1998). As the alliance partners interact and jointly tackle problems, they develop overlapping knowledge bases and develop 'partner-specific absorptive capacity' which leads to a superior ability in recognizing the value of information, absorb it and use it to create a knowledge-based relational rent (Cohen & Levinthal, 1990; Dyer & Singh, 1998; Grant, 1996a; Grant & Baden-Fuller, 2004; Kogut & Zander, 1992). The SDNM capability can facilitate the development of 'partner-specific absorptive capacity' and the management of the knowledge sharing process by connecting the right people on tactical and operational levels. Its different practices can also create an embedded social network and provide visibility of the desirable expertise's location within the partner firm (Uzzi, 1996; Uzzi, 1997).

5.3.3 Complementary resources

Synergistic combinations of complementary resources generate greater rents than each resource can individually create (Chung et al., 2000; Harrison et al., 2001; Rothaermel, 2001). The ability to identify the synergistic complementary resource

combinations and the ability to combine and deploy these unique combinations are critical determinants of relational rent (Dyer & Singh, 1998). Sharing of information and knowledge and working jointly enables the identification of partner resources and their location. Also, the compatibility of the partner firms' systems, processes and cultures, is required to benefit from complementary resources (Dyer & Singh, 1998; Kanter, 1994). Again, the SDNM capability can help in identifying, connecting, and coordinating the interfirm complementary resources and processes.

5.3.4 Effective governance

Because the alliance processes' coordination costs can be very high, effective governance of the alliance interfirm activities is the fourth relational rents determinant according to Dyer and Sing (1998). In recent times, lowering the transaction costs associated with coordinating the interfirm activities has led to the dominance of efficient supply chains; Wal-Mart is a clear example. And these coordination costs can either be controlled using legal contracts using third-party enforcement, i.e. law courts, and/or using self-enforcing agreements where formal financial hostages (Klein et al., 1978; Williamson, 1983) and informal mutual understanding, embeddedness, reputation and trust constructs enforce coordination between the alliance partners (Dyer et al., 1998; Gulati, 1995b; Uzzi, 1997). Indeed, informal enforcement means are superior to formal enforcement means and self-enforcing means are superior to third-party enforcement means such as contracts (Granovetter, 1985; Luo, 2002b, 2002a; Uzzi, 1997).

Hence for an alliance to be able to create and sustain a collaborative advantage, the alliance partners must perform the following activities that constitute the alliance

management capability (Dyer, 1996a; Dyer, 1996b; Dyer, 2000; Dyer & Hatch, 2006; Dyer et al., 2001; Dyer & Nobeoka, 2000; Dyer & Singh, 1998; Kale et al., 2002):-

1) Create trust and effectively manage knowledge sharing

2) Identify and combine complementary resources.

3) Invest in dedicated alliance assets and

4) Effectively govern the alliance relationship.

These four activities are selected from the strategic alliances literature and will be used to integrate the alliance management capability with the SDNM capability practices. Before that, it is noted that the coordination involved in these strategic alliance relationships has led some to call for the creation of a dedicated alliance function that is strategically placed within the organization. And Kale et al. (2002) have shown that firms that create a dedicated alliance function, in charge of the alliance management activities and more, enjoy superior alliance performance compared to those without such a function. In the next section a brief description of this alliance function is presented.

5.4 Dedicated Alliance Management Function

It is obvious that in order to facilitate the above critical strategic alliance decisions, effective alliance governance is required to effectively manage knowledge sharing, promote cooperation, enable collaboration, and provide measurement and accountability (Dyer et al., 2001). Indeed, through active governance a fit on strategic, relational and operational levels can be achieved (Ireland et al., 2002) and past alliances experiences can be accumulated in a conscious and constructive manner. Learning from

past alliance experiences is thus very important for developing alliance management routines, which accumulate over the course of repeated collaborative interactions. These routines that take place within the alliance management function are critical for accumulating and developing alliance management know-how, and hence for more effective collaborative agreements (Zollo et al., 2002). In support of the arguments for alliance functions, Kale et al., (2002) and Dyer et al. (2001) found that firms which had created a dedicated alliance function in order to coordinate alliance activities and assimilate and disseminate knowledge across the alliance network were more effective in building on their alliance experiences, i.e. learning from repeated engagement in a particular activity, and realized greater success than firms that did not have such a function (Rothaermel & Deeds, 2006).

Repeated trust-based interactions can produce learning that contribute to relational capital between individuals and organizations which in turn lowers coordination and production costs and provides access to complementary and specialized knowledge (Lorenzoni & Lipparini, 1999). Moreover, relational capital facilitates the management of the alliance by reciprocally increasing the levels of trust, increasing the sharing of knowledge and lowering the transaction costs and risks (Dyer & Singh, 1998). This relational capability is more likely to develop if the individuals from the same unit; i.e. dedicated alliance function, interact repeatedly, synthesize and discern each alliance experience to build an alliance management capability and properly benefit from alliance experiences (Dyer et al., 2001; Ireland et al., 2002; Kale et al., 2002).

Although alliance announcements by firms with more alliance experience have been shown to lead to greater stock market returns than announcements made by firms without such experience (Anand & Khanna, 2000), alliance management experience can lead to alliance success only if prior alliances are learned from in a systemic and cumulative manner. This occurs by capturing and sharing the alliance management know-how from past alliance experiences, to create alliance management capability (Kale et al., 2002).

A dedicated alliance management function within a firm, according to Kale et al., 2002, can be the focal alliance know-how learning point for the firm, facilitate the sharing of tacit knowledge throughout the focal firm and across the alliance, codify alliance know-how to retain the knowledge, and create relational capital between managers who meet regularly in training programs and summits. This function can also be the contact point for communication with potential partners and with the market in addition to having the authority over different functions in order to coordinate internal resources and processes spanning across firms and monitoring and evaluating the alliance performance (Dyer et al., 2001; Kale et al., 2002). From the above, the firm with an alliance function stands to gain more from the alliance relationship than a partner that does not have such a unit. Consequently, one can conclude that when all partner firms have such a function, the alliance will have a higher success rate.

In summary, networks and alliances have indeed replaced firms as units of competitive analysis in the new competitive landscape. Extant strategic management research on alliances and networks has shown that alliances and networks, if managed

effectively, can be a source of competitive advantage (Chen & Paulraj, 2004; Cousins et al., 2006; Cousins & Menguc, 2006; Gnyawali & Madhavan, 2001; Gulati, 1999; McEvily & Marcus, 2005). And the real challenge for enabling such an advantage is in aligning the incentives of separate independent yet interdependent firms within the value chain (network) and in convincing them to collaborate in order to effectively combine each other's complementary capabilities synergistically to produce the complex and differentiated products desired by the customers (Dyer, 2000). In this work, I propose and show how the SDNM capability can help manage alliances, through its role in integrating and managing the operational competencies that span the alliance partners, a capability shown to be a source of competitive advantage. Hence, the SDNM capability can, directly or indirectly, lead to competitive advantage.

Moreover, Spekman and his colleagues (1998) emphasize the role of the alliance manager and that the real challenge is in holding a perspective that views the alliance central to the strategy of the firm meanwhile combining it with the details associated with the day-to-day operational realities of alliance management, a task that SDNM is best suited to fill and accomplish. In the following section, the alliance management activities and the roles of the alliance management function will be integrated with the SDNM orientation and SDNM practices to answer the call by Ireland et al. (2002) for the analysis of conditions in which alliance management leads to competitive advantage. In this work I hope to address this question by showing how SDNM can be integrated into the alliance management capability activities and the dedicated alliance function as a mechanism to implement and enable the alliance management capability.

5.5 Alliance Management Activities and SDNM Practices

SDNM can effectively manage these vertical complementary alliances in order to obtain and sustain competitive advantage. In this work we recognize the importance of the resource based view (RBV) in that firms' resources play a significant role in their ability to attain and sustain competitive advantage (Barney, 2001). And complement the RBV of the firm with conclusions from the TCT and the network literature that highlight the importance of complementing a firm's resources with other firms' resources in a network to gain additional competitive advantage (Gnyawali & Madhavan, 2001; Gulati, 1999; McEvily & Marcus, 2005; Zaheer & Bell, 2005). In addition, based on network research that propose that "Firms with superior network structure maybe be better able to exploit their internal capabilities to enhance their performance" (Zaheer and Bell, 2005: 809), this paper builds on the works of Ireland and his colleagues (2002), Kale et al. (2002), Dyer (2000) and Dyer et al. (2001) and proposes that incorporating the SDNM orientation and SDNM practices into the alliance management function will operationalize the alliance management capability of the dedicated alliance management function.

As the products become more complex and the sources of knowledge become globally dispersed, no longer can an individual firm develop all the necessary knowledge and capabilities required to develop such products in a value creating manner that enables it to gain and sustain competitive advantage (Contractor & Lorange, 2002; Powell et al., 1996; Rothaermel & Deeds, 2006; Rothaermel et al., 2006). The decision to divest non-core businesses, taken by many firms, has led to the creation of a chain or a

network of independent suppliers and customers that may have once been part of the same vertically integrated organization.

The ability to align the internal units of any firm is an extremely important process in order to be able to integrate supply and demand management and efficiently create value for the end customer. One can imagine how important, and at the same time how difficult, the alignment of processes extended across independent yet interdependent firms making up the demand network is, especially in the absence of fiat. Therefore, in order to effectively identify the unique and synergistic combinations of resources and capabilities that are dispersed across the network of independent firms, firms can benefit from adopting the holistic SDNM approach. Next, I examine the relationship between SDNM and RBV and propose SDNM as a resource-accessing, resource-configuring and resource-combining capability that clearly falls under the RBV efficiency paradigm. Moreover, SDNM extends the static RBV concept beyond the firm to the supply network while at the same time provides it with the needed dynamism.

Combining and deploying resources and capabilities to create competencies has to be performed for resources and capabilities diffused throughout the demand network (internal and external) using interfirm linkages. Indeed, the linkages a firm has with its demand network members can help it identify and acquire VRIN tangible and intangible resources that it can subsequently configure and deploy to gain operational advantages (Rungtusanatham et al., 2003).

Hence, I posit SDNM as a business competency and a strategic, tactical and an operational capability. This multilevel nature of the SDNM capability rightfully enables

it to link the day-to-day operations to the business strategy. Moreover, SDNM by definition covers the movement and transformation of material, funds, information and knowledge between strategic alliance partners. Therefore, it is the right mechanism with which to integrate the alliance management capability and the alliance function concepts from the strategy field.

Because SDNM is concerned with integration between the firm's internal functional areas and those of the suppliers and customers in pursuit of efficiencies and effectiveness along more than one competitive priority it can lead to competitive advantage (Lummus and Vukurka, 1999). SDNM seeks to provide high quality products that consumers want and need when they want it at a lower cost than the competition (Vakharia, 2002). In other words, firms that develop and move desired products quickly and efficiently will gain an edge over their competitors, i.e. Wal-Mart (Nahmias, 2005). It is clear from the definition of SCM, "Supply chain management is the art and science of creating and accentuating **synergistic relationships** among the trading partners in supply and distribution channels with the common shared objective of delivering products and services to the 'right customer', in the 'right quantity', and at the 'right time'" (Vakharaia, 2002: 495), that effective SCM (SDNM) can lead to competitive advantage. Also, SDNM promotes a total system approach to manage the information, material, and services flows through the different stages of the value network (Chase, Aquilano, & Jacobs, 2001) in order to reduce uncertainties and increase visibility.

In the following paragraphs, I show how the alliance management research and the SDNM have much in common and integrating insights from the two research streams

will add to each field. Alliance management research within the strategy field provides a higher level and more abstract perspective of the alliances relationship while SDNM strives to manage and synchronize the day-to-day operations than span organizational boundaries in a holistic manner. Also, partnering on operational levels may only lead to competitive parity while partnering on both strategic and operational levels can lead to higher levels of competitive attainment (Mentzer et al., 2000). Seldom do SDNM researchers consider SDNM practices, such as what occurs between a buyer and a supplier under SRM or CRM, as a higher level knowledge sharing management process. On the other hand, rarely do strategy researchers consider the operational aspects of dedicated assets, and how they actually improve the productivity of a machine or of the logistics operations to support competitive strategies. In this section, an attempt will be made to incorporate the SDNM practices identified in CHAPTER III into the alliance management capability activities identified above and vice versa.

5.5.1 SDNM practices and the creation of trust and effectively managing knowledge sharing

Social capital and embeddedness perspectives are often used to explore the creation of trust and effective knowledge sharing within strategic alliance networks (Borgatti & Foster, 2003; Uzzi, 1996; Uzzi, 1997; Uzzi & Lancaster, 2003). And as previously noted, the presence of trust is quintessential for reducing transaction cost, sharing tacit know-how, investing in dedicated assets, and overcoming alliance contract limitations (Carney, 1998). Hence, mutual trust and commitment are necessary for a successful alliance (Cullen, Johnson, & Sakano, 2000) and creation of added value

(McCarter & Northcraft, 2007). And according to social network theory and social capital experts, trust between two firms can develop based on process reliability (competency) and/or based on behavioral relationships between individuals who develop goodwill toward one another based on respectful treatment and fair and just appropriation of rents (Blyler & Coff, 2003; Dyer, 2000; Gulati & Singh, 1998).

Firms and individuals within them are embedded in a network of interdependent relationships in which they interact on regular basis, jointly work on problems and often need to work collaboratively for individual and mutual benefit. Verily, individuals meeting on regular basis develop social bonds, better understand one another and develop superior assessments of character (reliability, trust) (Cousins & Crone, 2003). Hence, economic decisions are not made exclusive of social structures but to the contrary, social ties and relational constructs have a significant effect on deciding with whom to ally and how effective the alliance management process will be (Chung et al., 2000; Granovetter, 1985; Gulati, 1995a; Hutt et al., 2000; Koka & Prescott, 2002; Tsai, 2000; Uzzi, 1997; Walker et al., 1997).

Trust is not a static concept but the trust level varies as the relationship between two entities progresses (Das & Teng, 1998). Trust, which needs to be developed consciously, complements the power and control constructs within an alliance network in order to create greater commitment to the network efficiency and effectiveness (Ireland & Webb, 2007b). A minimal level of trust is required for any coordination and/or collaboration effort to be successful. Das and Teng (1998) present four trust building techniques among alliance partners. They propose that trust is build through 1)

risk taking, 2) equity preservation, 3) communication, and 4) interfirm adaptation. When an alliance partner notices that his partner has taken considerable risk by trusting him, he will excerpt extra effort to deliver on his promises, i.e. act in a trustworthy manner (Gulati, Khanna, & Nohria, 1994). Thus, trust is built through a reciprocal process of trusting and risk taking (Johnson et al., 1996).

However, because much risk is involved, the trust building process should be gradual and careful. SDNM practices such as SRM and CRM can play a critical role in identifying the reputable partner with whom the firm can take an initial risk to build a trustful relationship (Barney & Hansen, 1994). SDNM practices can enable an operational evaluation based on likelihood of interfirm processes' compatibility and synergy potential. In addition, SRM, through its active management of the supplier network relationships, and knowing the internal system capabilities of its supplier network (their ISCM) can measure a given firm's ability to deliver, and hence its trustworthiness. Also, because firms belong to multiple demand networks, preserving one's reputation is significant for future business opportunities (Uzzi, 1997), especially under SDNO, where information from the entire network is integrated and shared. Characteristics such as reputation play an important role when selecting strategic alliance partners and have an effect on sustained alliance success (Saxton, 1997).

SRM sub-processes: strategic supplier partnership, supplier base reduction, product design collaboration, sourcing, procurement and supply collaboration, can each have a positive effect on the trust building techniques. And so can the ISCM sub-processes: strategic planning, demand planning, supply planning, order fulfillment,

manufacturing and service flow management, lean practices, agile practices, and postponement. By actively seeking to optimally reduce the supply base in an effective manner by considering all relevant issues (resources, costs, path-dependencies, flexibility, innovation, complexity, responsiveness, risks, innovation, boundaries, etc.) (Choi & Krause, 2006), SRM promotes building a strategic supplier partnership, i.e. strategic alliance, which signals desire and willingness to take risks and trust.

On the other hand, by strategically incorporating all network resources in order to match supply and demand and carrying out all other activities under ISCM effectively creates process reliability reputation, which leads to trust in the process and hence the firm. Last but not least, CRM coordinates with the customer to benefit maximally from the supplier's ISCM and SRM capabilities and create a core competitive differentiator (for example, Seven-Eleven Japan) (Lee & Whang, 2001). Of course, all this is facilitated through the information sharing process of SDNM which enable coordination and tight organizational relationships between companies (Lee, 2000; Lee et al., 2000).

Also, CRM, SRM, ISCM and information sharing are critical for equity preservation. By integrating the entire demand network, the SDNM capability provides visibility and measurement of each member's value contributions and hence facilitates better opportunity for equity when allocating profits and costs and even better understanding and tolerance of short-term discrepancies (Das & Teng, 1998). Communication and adaptation are techniques that enable the building of trust and the SDNM concept has been developed to enhance both within the firm and within the network trust. SDNM practices provide the means through which the alliance partners

communicate, meet regularly and develop common values, relational and social capital, share information and knowledge, adapt for one another, and consequently build trust.

Interfirm adaptation is a complex process depending on the depth of the interfirm processes involved. However, adapting to the partner's requirements helps in building trust (Das & Teng, 1998). SDNM practices and SDNO, by stressing processes integration, clearly facilitate the adaptation by first considering the effect of an operational decision on every dependent process throughout the alliance and beyond (Gulati, Lawrence, & Puranam, 2005; Leenders et al., 2006). Second, enable more effective evaluation of the benefits and costs of any decision. And third, by providing visibility of the demand network and total possible benefits SDNM practices help remove hesitations and fears due to misinformation and misperceptions and encourage the alignment of the objectives and efforts of all stakeholders. In fact, without the SDNO and SDNM practices (CRM, SRM, and ISCM) implemented in the alliance network, the adaptation process will likely take longer and not be as efficient. SDNM practices also relate to the control mechanisms suggested by Das and Teng (1998): Goal setting, structural specifications, and cultural blending, which they claim when integrated with trust help build confidence in an alliance partner's cooperation.

This brings us to the first proposition in this chapter, which is:

Proposition 1a: SDNO and SDNM practices enable effectively creating trust in a strategic alliance.

On the other hand, the benefits of trust among strategic demand network members encourage them to develop and invest in SDNM practices that promote and

enable even higher levels of trust. This will lead to a reciprocal relationship wherein the trust building and SDNM practices will foster the other. Adopting a trust building objective, among other strategic objectives, while building the SRM processes, will lead to a more comprehensive SRM. Recognizing the need to take risks, preserve equity, communicate and adapt for the sake of the partner(s) in order to create trust and using this framework while developing long-term relationships with strategic suppliers will lead to more effective SRM sub-processes.

Using a trust perspective, a firm is more inclined to take steps that signal to its strategic supplier its willingness to take risks for the sake of the partnership, and is also more inclined to communicate when it works collaboratively with its supplier on new product design and development. It also encourages the preservation of equity when allocating total demand network costs and profits. Moreover, a firm will find it easier to take risks with a supplier with whom a firm has established a strategic supplier partnership and is among the reduced supplier base. And the firm must realize that when narrowing its supplier base or establishing strategic long-term relationships, it is setting up itself for a situation in which it has to take risks, communicate, preserve equity and adapt.

This is also true for CRM, ISCM and information sharing SDNM practices. Seeking to build trust with a customer or supplier requires that a firm design its CRM, ISCM and information sharing processes in a manner that engender trustworthiness. ISCM should be able to integrate the knowledge from CRM and SRM regarding customer and supplier processes so that it can adapt to demand network changes. In

addition, CRM and information sharing, when implemented with the trust creation goal, will be more effective in sharing information, building a closer customer relationship, and deciding what to share and when. Thus, developing SDNM practices under the framework of creating trust will produce SDNM practices that are more successful in building trust, and consequently will lead to more effective SDNM practices.

Proposition 1b: Adopting a trust building objective when developing SDNM practices will lead to more effective SDNM practices because trust facilitates the work of SDNM practices.

Due to specialization, much of the knowledge that complements a firm's know-how and is required in order to provide superior products often lay outside the firm (Dyer, 2000). Therefore Gulati (1999), Grant (2004) and Dyer and Hatch (2006) consider accessing the knowledge of alliance partners and sharing this knowledge as the **critical** resource obtained through strategic alliances. However, critically valuable knowledge has to be first identified and synergy possibilities be evaluated before a decision is made to establish an alliance. Also, after an alliance is established, knowledge sharing does not automatically occur, instead the knowledge sharing process must be proactively managed in order to access what is necessary and protect what is proprietary (Kale et al., 2000).

Knowledge-based capabilities that create and apply knowledge (Grant, 1996a) are strategic capabilities (DeNisi, Hitt, & Jackson, 2004), which are "those systems or processes that an organization creates to leverage its resources to produce a competitive advantage" (DeNisi, et al., 2004: 13). Knowledge can be explicit, which can be easily

codified, transferred, communicated, and learned, or tacit, which is difficult to codify, or to teach in a course or seminar and has to be usually learned by performing the task (Nonaka, 1991). The ability to share explicit knowledge in a timely manner with all stakeholders is what is being promised by Enterprise Resource Planning (ERP) systems and other information-sharing systems under SDNM (DeNisi et al., 2004). Although, sharing of explicit knowledge leads to gains in efficiency and reduces forecasting and ordering errors, the sharing of tacit knowledge promises the greatest benefit (DeNisi et al., 2004).

Tacit knowledge on the other hand can not easily be transferred via an ERP system, but instead, it is acquired by direct experience through repeated intimate personal interactions, joint problem solving and collaborative efforts (Krause et al., 2007). Alliance partners' interactions occur over a long period of time and lead to a socially embedded structure, which facilitates the exchange of more proprietary and tacit knowledge (Uzzi, 1997) and create strong ties that promote adaptation (Kraatz, 1998). When firms adopt a SDNO, they look at the entire demand network as an extended enterprise and analyze the implications of tactical activities involved in managing the various flows in a demand network. And a 'macroculture', which is a system of shared values, norms, expectations, knowledge, and culture, is created out of direct and indirect relationships (Jones, Hesterly, & Borgatti, 1997).

This consideration for others and desire to collaborate creates opportunities for individuals from different organizations within the demand network to meet regularly and jointly deliberate on decisions that affect the demand network members. Surely, the

continuous interaction can be a critical source for the creation of social capital among individuals and accordingly among firms (McGrath & Sparks, 2005). Consciously building social capital, via affinity groups for example, within the demand network is likely to produce superior performance on costs, flexibility and value creation measures (McGrath & Sparks, 2005).

Beyond SDNO, when demand network members implement SDNM practices they create mediums for knowledge sharing. As discussed in the previous chapter, SDNM practices can enable effective sensing and learning capabilities. They enable the identification of desirable knowledge or knowledge-based capabilities within the demand network and help in accessing, transferring and integrating them.

Furthermore, the SDNM practices and routines can enable both the exploitation of existing knowledge and the creation of new knowledge. This is done by first, pooling multiple sources of diverse knowledge unavailable within an individual firm (Kogut, 2000), and then establishing routines for sharing and integrating the knowledge (Dyer & Nobeoka, 2000; Nonaka, 1991, 1994). SDNM promotes joint work with suppliers, through SRM and it sub-processes, and with customers through CRM and its sub-processes. Next, the SDNM capability incorporates the knowledge gained from both (customers and suppliers) to better manage the internal supply chain processes and make it adaptable to supplier and customer demands, hence facilitating network 'strategic flexibility' (Hitt et al., 1998; Shimizu & Hitt, 2004). Strategic flexibility is the firm's ability to competitively respond, using both internal and external factors, to environmental contingencies in a timely manner, thus it is very critical for sustained

competitive advantage (Das & Elango, 1995). And the SDNM capability is clearly relevant for enabling strategic flexibility.

Moreover, the SRM process seeks to understand the suppliers business and capabilities and incorporate the suppliers' competencies into the firm's ISCM and CRM processes in order to make a more effective supply base reduction and strategic partnership decisions (Liker & Choi, 2004). Having a smaller number of strategic suppliers, as promoted by SDNM, facilitates an embedded relationship with the chosen partners, which in turn leads to better information and knowledge sharing. This knowledge is not only tacit but also holistic, enabling a better understanding of the knowledge-based capability and how it complements other processes in the demand network (Uzzi, 1997).

The CRM process, on the other hand, integrates customer-related knowledge, whether it is the customer's production plans, promotions, entry into a new market, new use of the supplier's product, or the sensing of a technological change downstream. CRM and SRM processes are how the firm connects its internal processes with the suppliers and the customers and as such play a critical role in sharing knowledge among the alliance partners. Because SDNM has its roots within operations management and deals with the flows of products and their transformation, the flows of information, and the flows of funds, it is well situated to integrate the knowledge of boundary spanning day-to-day operations and processes and connecting them to the business strategy. Indeed, operational competencies are manifestations of knowledge-based capabilities.

The ISCM process is concerned with managing all the processes within the firm to match supply with demand and holds the key to why some firms perform better than competitors even when they share the same suppliers (Takeishi, 2001). ISCM can be used to manage internal resources and capabilities (strengths and weaknesses) in order to exploit opportunities and reduce or neutralize threats (SWOT) (Barney, 1995). It also takes input from the CRM and SRM, using information sharing technologies and personal meetings to make the internal processes more efficient and effective (Droge, Jayaram, & Vickery, 2004). Hence, SDNM processes as a whole enable the sharing of critical knowledge from suppliers and customers and synthesize all the gained knowledge to develop more efficient and agile demand networks that provide customer desired operational capabilities such as product quality, delivery reliability, process flexibility and/or cost leadership (Frohlich & Westbrook, 2001, 2002; Rosenzweig et al., 2003). Therefore, because the SDNM capability operates on multiple levels, it connects the operational and strategic levels, and its core competency is integrating complementary interfirm processes and competencies, it can aggregate the knowledge dispersed throughout the demand network, transfer it, share it, and even combine it to create a new knowledge-based capability and/or identify and exploit new opportunities. In fact, knowledge-based competitive advantage is created on a process level; without understanding partner processes and how they fit with one's own, it would be difficult to understand and share that knowledge.

SDNM processes are collaborative activities that bring the demand network members together to actively manage the network as a whole in order to efficiently and

effectively match supply and demand. These SDNM processes, through constant interactions between the partners create an overlap of knowledge, a common language and hence increase the absorptive capacities of the partner firms, which further facilitates knowledge sharing. Hence the following proposition:

Proposition 1c: SDNO and SDNM practices facilitate effective knowledge sharing within strategic alliances.

Viewing the demand network interfirm linkages from a strategic knowledge-based view of the alliance (Grant & Baden-Fuller, 2004), leads to a more effective development of the SDNM processes. When the firms composing the strategic demand network adopt the SDNO, and when they view the interfirm linkages as opportunities for knowledge creation and sharing rather than merely perceiving it as channels for the transfer of materials, funds and explicit information, they are more likely to develop and implement SDNM processes that support knowledge sharing. This reciprocal relationship leads to more effective knowledge sharing which produces more fruitful alliance management capability and more effective SDNM processes.

CRM, SRM, ISCM and information sharing are processes that can enable knowledge and knowledge-based capabilities within the demand network. And even though knowledge as an intangible asset has the potential for explaining why some demand networks outperform others, seldom have SCM researchers viewed SDNM practices and processes as knowledge accessing, transferring, and/or knowledge combining and creating processes (Hult et al., 2006). The knowledge base and other value adding resources and capabilities of any firm are path-dependent and are

accumulated by interpreting past experiences (Lei & Hitt, 1995). And the ability to share it depends to a large extent on the existence of knowledge-base overlaps and partner-related absorptive capacities (Cohen & Levinthal, 1990; Grant & Baden-Fuller, 2004). In fact, knowledge development is linked to differences in cycle time performance between strategic supply chains and consequently the performance difference between them (Hult et al., 2004).

Therefore, when strategy promotes the sharing of knowledge (both explicit and tacit) the demand network benefits greatly because it helps facilitates the CRM, SRM and ISCM and information sharing processes of SDNM which endeavor to improve the efficiency and effectiveness of the operations throughout the demand network (Lee, 2000). SRM, which focuses on the relationship of a firm with its suppliers, will be more effective if the SRM process and sub-processes are designed with one of the primary goals being knowledge sharing. When making a decision to reduce the supply base, to establish a strategic partnership, or to develop procurement and supply collaboration, the knowledge of the suppliers' capabilities, technologies and how they complement the firm's capabilities is critical to the firm's and the network's competitive advantage. The same reasoning can be used for CRM.

ISCM deals with the internal processes and operations of the firm performed to meet the customer demand. Hence, it deals with the core competencies of the firm and uses the knowledge obtained from the customer though CRM and the supplier through SRM in order to design and manage the internal processes in a manner that is compatible with the adopted firm and network competitive strategy. Capacity decisions, strategic

planning, demand and supply planning are high cost decisions with direct consequences for on the firm's performance and ability to meet the demand and create rent. ISCM aggregates the knowledge accessed from the demand network in order to integrate all the processes within the firm and create a fit between them and the demand network (Frohlich & Westbrook, 2001, 2002).

In fact, the firm's internal processes are often the main beneficiaries from knowledge sharing with the demand network members because firms often evaluate the performance based on the effectiveness of the processes they control, which are mainly inside the firm. The same logic applies to each firm in the network. Moreover, knowledge and knowledge-based capabilities are among the main reasons firms seek external suppliers and partners (Kogut, 1988). Thus, integrating the knowledge from suppliers and customers should produce better ISCM.

Many SCM researchers call for and show the benefit of sharing information among supply chain members. They call for designing and planning inventory replenishment policies, production capacities using information regarding inventory positions and demand at all installations in the system and show that information sharing produces better decisions and higher performance (Bitran et al., 2007; Karaesmen, Buzacott, & Dallery, 2002; Marklund, 2002; Moinzadeh, 2002; Vickery et al., 2003; Vollmann et al., 2000). Point of Sale (POS) data, for example, reduces order variances (Croson & Donohue, 2003), and based on the availability of POS data, Vendor Managed Inventory (VMI) plans, under which the retailer gives the vendor full responsibility of its

products' inventory, can be implemented to reduce order variances to even a greater extent. Hence the following proposition:

> *Proposition 1d: Adopting a knowledge sharing objective when developing SDNM practices will lead to more effective SDNM practices because knowledge and knowledge-based capabilities are the most critical resources in a strategic demand network.*

5.5.2 SDNM practices and identifying and combining complementary resources

Dyer and Singh (1998) identify complementary resources/capabilities as one of four potential sources of interorganizational competitive advantage. Strategic management researchers have shown that in order for an alliance or an interfirm cooperative initiative to be successful, the partnering firms must first own complementary assets (tangible and intangible) and second be able to exploit these complementarities (Harrison et al., 2001; Rothaermel, 2001). Yet, the strategy literature rarely investigates the operational level complementarity, which is where the different processes from different firms are integrated through interfirm linkages. The SDNM capability is well suited to integrate the firms' processes with complementary competencies within the alliance and the network.

Critical to competitive advantage resources and capabilities, which increasingly exist outside the firm, need to be combined with the firm's internal competencies in a unique way that creates VRIN resources and/or capabilities and lead to competitive advantage. Having the visibility of the entire demand network and how the processes throughout the network complement one another, enabled by the SDNM capability, can

lead to superior opportunity identifying abilities. Moreover, being aware of how the different processes interact and affect each other, by adopting SDNO and implementing SDNM practices, also facilitates effectively combining the complementary resources. Also, the SDNM capability, through its holistic management of operational competencies and processes, gives the firms the ability to more effectively structure resources, bundle resources to build capabilities, and leverage capabilities to create value for the end customer (Sirmon & Hitt, 2003).

A firm with SDNO that actively tries to manage the strategic demand network using SDNM practices is able to understand how the end customer uses the product and use that knowledge to improve its operations and the operations of its suppliers and customers. Moreover, when the firm tries to understand the supplier's capabilities and involves the supplier in new product designs, complementary competencies are more easily identified (Ragatz et al., 2002). Also, the identification of the complementary resources is easier when there are fewer suppliers with whom the firm establishes strategic partnerships. As partners exchange employees and repeatedly work concurrently on projects, a clearer picture of all the core competencies of each partner is revealed for the alliance partners.

A communication matrix, where the partner firm knows who to contact for specific skills, is created through the SDNM practices not only to facilitate more efficient information sharing but can also results in more efficient conflict resolution (LaLonde, 1998). An effort should also be made to identify customers' complementary resources and capabilities. A firm can, through CRM, identify how its capabilities fit

with the customers. It can also go beyond the direct customer to the end customer to evaluate its needs and identify changes so that the firm can adjust its capabilities to match a future change in the intermediate customer's demand (Lee, 2004).

Meanwhile, ISCM processes incorporate the knowledge gained from SRM and CRM in order to identify and sometimes develop the resources and capabilities that complement those of customers and suppliers. Without an effective ISCM, the firm can't truly benefit from identifying the customers' and the suppliers' competencies because ISCM sub-processes deal with managing the internal value adding process in a manner that is in sync with the customers' demands and the suppliers' capacities and abilities. Moreover, as SRM and CRM sub-processes are best situated to identify suppliers' and customers' complementary resources and capabilities, respectively, ISCM is best suited to identify and build internal competencies that complement supplier and customer competencies.

Differences in alliances experience, differences in internal search and evaluation capability, and differences in the ability to acquire information are reasons listed by Dyer and Singh (1998) as the sources of the differences among firms in identifying potential partners with complementary resources. Taken together, the SDNO and the SDNM practices enable the firm to identify complementary resources and capabilities within the firm, within the demand network, and beyond the network through indirect ties through network partners (Ahuja, 2000b; Burt, 1992). As functions that deal directly with customers on operational and strategic levels, they also enable search and

evaluation and seek to acquire information about suppliers and customers. Hence the proposition:

Proposition 2a: SDNO and SDNM practices facilitate effective identification and combination of network complementary resources and capabilities.

SDNM practices deal with operational issues such as production technologies, production capacities, delivery schedules, inventory levels, supplier technical input, quick response efforts, purchasing costs, planning information, demand uncertainty and security, buyer technical assistance, flexibility and many other issues faced by operations and value network managers (Stuart & McCutcheon, 1996). And, when the firm sets the identification of customer and/or supplier complementary resources in order to combine them with its own as an objective, the SDNM practices can be developed in a manner that seeks to identify and combine of complementary resources and capabilities. Furthermore, when the firms composing the demand network realize that synergistic opportunities exist in combining complementary resources, they will fine tune the SDNM practices to facilitate their identification.

Although firms used the SRM, CRM, ISCM, and information sharing processes in the past to mostly focus on efficiencies, they are increasingly realizing their potential for accessing and building resources (effectiveness) (Miles & Snow, 2007). Also, they are realizing that future competitive positions depend on current strategic decisions. In fact, the strategy field has shown that many alliances fail but those alliances that seek complementarity are more likely to succeed. The SDNM literature should use findings

from the strategy field to guide the development and implementation of SDNM practices.

Also, adopting this desire to exploit complementarities encourages alliance partners to adapt their systems and cultures in ways that facilitate coordinated actions. Even in the presence of cooperative desires, the 'adaptive capacity' of the strategic vertical alliance partners depends on coordinated adjustment (Gulati et al., 2005); which the SDNM practices endeavor to accomplish through for example creating strong ties between the partners (Kraatz, 1998) and creating visibility upstream and downstream (Cooper et al., 1997b). Thus, having the objective of exploiting complementarities can help align incentives within the network and enable the effective implementation of SDNM practices which take much effort and commitment. Hence, the proposition:

> *Proposition 2b: Adopting the objective of identifying and combining complementarity resources and capabilities when developing SDNM practices will lead to more effective SDNM practices.*

5.5.3 SDNM practices and investment in dedicated alliance assets

Investment in an asset, whether a factory, equipment, processes and people, that are dedicated to a specific customer or supplier is considered a risky decision by those who adopt the purest TCT of alliances (Williamson, 1985). These assets carry extremely high risks of hold-up and loss of large investments if the customer, supplier or even the market conditions change rendering the asset unusable in another context. In truth, a minimal level of trust and knowledge sharing has to exist before a firm decides to make

such a substantial investment that makes it vulnerable to its partner's actions and conditions.

Nevertheless, the huge success enjoyed by Toyota and other Japanese auto manufacturers is to a great extent due to investments in dedicated asset made by their suppliers (Dyer, 1996a; Dyer, 1996b; Dyer, 2000; Dyer et al., 1998; Dyer & Hatch, 2006; Dyer et al., 2001; Dyer & Nobeoka, 2000; Dyer & Singh, 1998). By locating a firm's representatives at the customers' and/or suppliers' plants, by locating near the customers, by investing in specialized machines, by dedicating employees to work with specific customers, the Toyota demand network has been able to lower inventory, transportation, and production costs. Moreover, Toyota's integrated product development philosophy has lead to improvements in quality, time-to-market, and product-development coordination (Koufteros et al., 2002). The costs saved due to site specialization, the quality and differentiation benefit of equipment specialization, and the better coordination of interdependent activities because of human specialization are some of the means through which dedicated assets can lead to demand network competitive advantage (Dyer, 1996b; Dyer, 2000; Dyer & Hatch, 2006; Dyer et al., 2001).

The partnership within the demand network does not automatically lead to collaborative advantage, i.e., network-based competitive advantage; instead, the partnership requires effective management to encourage investment in dedicated assets, knowledge sharing and trust (Gomes-Casseres, 1994). SDNM strives to manage the entire demand network as an extended enterprise where each firm within the network

shares and adopts the objectives of the entire network and work in a collaborative and synchronized manner to create the most value for the end customer, hence create rent and attain and sustain competitive advantage as a network and subsequently for the firm.

For example, by seeking to create strategic partnerships with certain suppliers, individuals within the SDNM unit in charge of SRM are aware, through ISCM and CRM, of both, its own and the customers' capabilities and requirements. This knowledge leads to supplier related decisions being made based on a more holistic view, which can better optimize the entire network instead of just one stage. Therefore, SRM individuals, adopting a TC view, a RBV, or even a KBV are the best candidates for making partnership and supply-base reduction decisions in addition to the more operational product design collaboration, sourcing and procurement and supply collaboration decisions.

It is through SRM and its sub-processes that firms interact repeatedly and make daily operational decisions that implement the strategies set by the firms and the network. Therefore, actively managing the supplier relationships leads to better decisions regarding investing in and managing the dedicated assets (Song & Di Benedetto, 2008). Conversely, CRM extends the firm's visibility across the intermediate customer to the end customers. It also provides the firm with knowledge of how its processes and the customers' processes can be integrated. The firm as a supplier can use CRM to be more effective in deciding whether or not to invest in a dedicated asset because CRM and SRM help firms jointly manage and benefit from the dedicated assets.

ISCM integrates the customers' or suppliers' dedicated assets with all other internal processes. In fact, the decision to invest in a dedicated asset falls under the jurisdiction of the ISCM because strategic planning, demand planning, supply planning, order fulfillment, manufacturing and service flow management, lean practices, and agile practices are all mainly based on internal resources and capabilities. Also, unless the firm is able to integrate and coordinate dedicated assets with its own unique assets, it will not be able to benefit fully from the dedicated asset. The human knowledge, the machine, or the site-specific assets need to be integrated with all other operations and assets and the ISCM process is concerned with just that. ISCM provides the holistic internal view of all internal processes and processes' interdependencies; hence it is critical to the success of any dedicated asset investment.

The SDNO and SDNM as its realization tool thus are best qualified to facilitate a more effective dedicated assets decision and management of these assets in order to create a collaborative advantage. SDNM promotes and enables long-term relationships and larger volumes of business to strategic partners, which lead to greater potential for generating rent from relation-specific assets (Dyer & Singh, 1998). Hence the proposal:

> *Proposition 3a: SDNO and SDNM practices facilitate effective dedicated assets investment decisions and the management of dedicated assets in strategic demand networks.*

On the other hand, dedicated assets create more opportunities for coordination and can help to realize the goals of SDNO and SDNM. Therefore, when firms initiating alliances and joining networks believe that investing and managing dedicated assets can

potentially lead to competitive advantage, they will be more receptive of the SDNO and SDNM practices and requirements that accompany dedicated assets. Moreover, establishing a strategic partnership and realizing the benefits of dedicated assets will lead to more collaboration in managing the interfirm processes.

Indeed, SDNM practices are easier to implement when dedicated assets are present because they engender mutual cooperation between the partners as the machine pertains to the specific relationship and lead to higher product differentiation and performance. Also, unilateral commitments, in the form of dedicated assets, signal serious commitment to the partnership and active involvement in the management of the interfirm processes (Gulati et al., 1994). Therefore, a strategic understanding, of the benefits of dedicated assets while developing and implementing SDNM processes, will lead to more effective SDNO adaptation and SDNM practices implementation. Hence the following proposition:

> *Proposition 3b: Understanding and believing in the benefits of a dedicated asset, when developing and implementing SDNM practices, will lead to more effective SDNM.*

5.5.4 SDNM practices and effectively governing the alliance relationship

How an alliance relationship is governed affects the transaction costs, creation of trust, willingness to invest in dedicated assets, and the sharing of knowledge (Dyer, 1996a). Moreover, the alignment of transaction attributes with governance structures plays a key role in safeguarding specialized investments and thus their ability to lead to competitive advantage (Williamson, 1991a). Although TCT promotes efficiency in

alliance governance, Dyer and Singh (1998; 670) also address “value-creation initiatives” that create relational rents under their effective governance construct.

Governance can be either third-party enforced or self enforced. The first is based on contracts, which are often incomplete and incapable of accounting for all possible future contingencies; when contracts are used, changes to the initial governance agreement are more common (Reuer, Zollo, & Singh, 2002), and are enforced by legal institutions. The second type of governance on the other hand does not depend on a third party for enforcement of the agreements. Partners conform to agreements because of ‘formal’ (financial hostages) (Dyer & Singh, 1998; Klein et al., 1978) or ‘informal’ (goodwill trust, reputation, and/or embeddedness) self-enforcement mechanisms (Dyer & Singh, 1998; Uzzi, 1997). In fact, ‘formal’ and ‘informal’ safeguards such as trust lead to lower transaction costs, as previously discussed, than that possible by even the most complete contracts. Nonetheless, formal contracts and relational governance complement one another (Poppo & Zenger, 2002). Moreover, in radical innovation alliances, partner choice (friend, acquaintance, stranger), governance structure (formal or informal) and alliance scope can play substitutive knowledge protection roles and must be considered simultaneously (Li et al., 2008).

SDNM practices are not only efficiency driven, but when adopting a capability and resource building perspective they can also build unique and idiosyncratic resource combinations that are specialized to the relationship and lead to competitive advantage. Through SRM, CRM, information sharing and ISCM, SDNM can align transactions not only on dyadic levels but also on a network level. The SCM concept in its early years

focused on reducing inventory, distribution, and production costs, among supply chain-related costs. However, as internal productivity improvements and cost reduction initiatives reached their limits, making the supply chain more agile, flexible, aligned and innovative presented the greatest future opportunities (Fisher, 1997; Lee, 2002, 2004).

Given that demand- and supply-side factors determine competitive advantage, a firm's ability to integrate supply and demand by meeting and or exceeding market needs more efficiently and effectively than other firms helps it gain a competitive advantage (Grant, 1996b). This integration of supply and demand management within and across the firms in the supply chain (and consequently the demand network) is again by definition the essence of SCM and SDNM according to the SCM definition. Therefore, the SDNM practices and their sub-processes are critical parts of the alliance transaction costs.

Indeed alliance governance is very critical and it is on the operational level that the network firms' employees interact, a level that SDNM was conceived to integrate and optimize. SDNM plays a particularly important role in the self-enforcement form of governance because SRM and CRM create embeddedness between network firms and their employees. Through repeated interaction, through goal alignment, through joint problem solving, through collaborative efforts to lower costs and improve the network, and through the creation and adaptation of SDNO, SDNM practices lead to the creation of trust, which consequently lowers transaction costs (Zaheer & Venkatraman, 1995). In addition, in highly connected networks, where the reputation of a firm is a very valuable intangible asset, the loss of one's reputation can be devastating to business as the word

of opportunistic behavior spreads to potential future partners very fast. Under SDNM, where managers work collaboratively together, opportunistic behavior with one network member can lead to the loss of reputation with all network members. This will lead firms to exert extra effort to make a partnership work.

SDNM practices, by definition, enable self-enforcement by:

1) Making visible, through joint work, each member's contribution, and thus helping to gain their fair share of the payoff,

2) Enabling complex adaptation on the fly, and

3) Fostering long-term relationships, hence reciprocity of actions.

According to Dyer and Singh (1998: 670), all of the above outcomes lead to lower transaction costs. SDNM practices also create social complexity and unique tacit elements that govern the alliance relationships that make copying by competitors more difficult. Therefore, SDNM practices, taken together lead to more effective governance of the alliance relationship, whether reducing transaction costs or creating idiosyncratic resource combinations that require knowledge sharing, dedicated assets and trust. SDNM addresses interfirm operations and connects them to the strategy, thus making it an effective tool for strategy implementation. Hence the proposition:

Proposition 4a: SDNO and SDNM practices enable effective governance in the strategic demand network.

On the other hand, this emphasis on effective governance and its role in facilitating investments in dedicated assets, sharing of knowledge and building of trust should help in the implementation of SDNM practices. When network partners realize

that SDNM endeavors to increase the efficiency and the effectiveness of the alliance network governance, they will be more inclined to share knowledge and work jointly in a collaborative manner. When partners approach SRM and CRM with effective governance objectives, they will not only focus on transaction cost elements but also on value-creating initiatives. Concepts of reputation, goodwill trust, social complexity, and embeddeness are worthwhile adopting in the SCM (SDNM) research and practice.

Japanese auto firms have long used self-enforcement for governance and have historically had lower transaction costs and more effective knowledge sharing than their western counterparts (Dyer, 1996b; Dyer, 2000; Dyer & Ouchi, 1993). Incorporating self-enforcement, especially the informal mechanism of trust, reputation, and embeddedness in developing long-term strategic relationships and SDNM practices can facilitate better implementations of the practices and lead to more effective demand network management (Krause et al., 2007). Hence the proposition:

Proposition 4b: Emphasizing effective governance, when developing and implementing SDNM practices, will lead to more effective SDNM.

5.6 SDNM Practices and Dedicated Alliance Management Function

A dedicated alliance management function can work as the focal point in which executives in charge of the SRM, CRM, and ISCM can be located. A place where they work coherently in order to manage the strategic demand network by acquiring, synthesizing, building, and leveraging alliance management knowledge and experience (Dyer et al., 2001; Ireland et al., 2002; Kale et al., 2002). SDNM can support the function's key roles, as promoted by Dyer et al. (2001: 38), of improving "knowledge-

management efforts", increasing "external visibility", "providing internal coordination", and help the function resolve "accountability" and "intervention" problems.

SRM, CRM and ISCM activities integrate the knowledge available throughout the demand network as they manage the interfaces between the partnering firms. SRM for example is best capable of learning the suppliers' capabilities, while CRM is best situated to sense the customers' needs and requirements. As functions connecting the firm with its suppliers and customers, CRM and SRM help the ISCM process perform better by enabling the firm's internal processes to: 1) serve the suppliers and the customers better by giving them access to knowledge pertaining ISCM capabilities and 2) incorporate the customers and suppliers input into smoothing the internal processes, realizing higher efficiencies and achieving demand network alignment. Hence, SDNM activities to manage the interfirm processes on an operational level are critical means for knowledge management efforts.

The same case can be made for providing external visibility because SDNM processes are in fact the capabilities that manage the interfirm operations and thus can provide the best picture of the synergy opportunities. Moreover, SDNM practices, when part of the alliance management function, provide valuable input for effectively screening potential partners. In addition, ISCM is concerned with integrating and coordinating internal operations by incorporating knowledge gained from CRM and SRM, thus it can carry on the internal coordination role of the alliance function. SDNM practices also enable communication between different stakeholders, hence lead to better coordination.

Engaging actively, through SRM and CRM, with suppliers and customers in order to manage for an efficient and effective demand network enables the dedicated alliance function to define responsibilities and hence resolve accountability issues. On the other hand, SDNM leads to relational capital where individuals know, and more importantly understand their partners' perspectives, which facilitate timely intervention. Therefore, I propose the following:

Proposition 5a: SDNO and SDNM practices can facilitate the strategic alliance management function's activities.

At the same time, who manages the supply chain? Where should the unit in charge of managing the supply chain be located? Both are common questions in the SCM literature. Locating the people or units in charge of SRM, CRM and ISCM within one unit that is well placed within an organization, provides the legitimacy and authority to enforce decisions and bring different units along. All of which are critical to the effectiveness of the SDNM capability. When all SDNM activities are placed in one unit and share knowledge, they are better able to manage the demand network because they can easily combine each capability's knowledge-base, which is needed for a more holistic and systematic management.

Also, repeated interactions between function members of the partnering firms can be used to create demand network socialization (through 'social events', 'joint workshops', 'on-site visits', 'regular conferences', 'team building exercises'), which lead to more effective and efficient network management (Cousins et al., 2006; Cousins & Menguc, 2006). These individuals who interact repeatedly create personal

relationships over time that further facilitate cooperative interorganizational relationships (Ring & Van De Ven, 1994). Moreover, placing SDNM responsibility within the function will link the strategic objective of the alliance to the daily operations of each firm and the operations extending across the network firms. Hence the proposition:

> *Proposition 5b: Placing the individuals in charge of the SDNM, within the strategic alliance function, will better connect strategy to daily operations, hence lead to more effective SDNM.*

5.7 Concluding Remarks

In this chapter an effort was made to integrate research on alliances, and the theories applicable to this area, from the strategy field with the SDNM practices and the extant SCM literature. In the past couple of decades, as the alliance form of organizing became increasingly ubiquitous, SCM (SDNM), even though ignored to a great extent by the strategy field, increased in popularity and importance. However, coordination between demand network members is not intuitive and many obstacles hinder such coordination. These barriers to coordination can be due to reasons related to incentives, and/or information processing, as well as operational, pricing, and behavioral obstacles (Chopra & Meindl, 2004). These obstacles along with different organizational cultures, different partner objectives, lack of leadership, process integration difficulties, slow results, and opportunistic behaviors of partners are among the many reasons for the high failure rates of the strategic alliances.

According to Chopra and Meindl (2004), SDNM levers to achieve coordination between alliance partners include but are not limited to:

1) Improving information accuracy by sharing POS data; implementing collaborative planning, forecasting and replenishment (CPFR) initiatives, which call for the cooperation of the supply chain partners in the management of inventory through providing visibility throughout the supply chain; and enterprise resource planning (ERP) systems,

2) Improving operational performance by applying process improvement schemes such as VMI and smoothing the flow of products,

3) Aligning goals and incentives by aligning the different objectives by such schemes as buy back contracts, options contracts, revenue sharing contracts (Cachon & Terwiesch, 2006), and

4) Building trust through process reliability and embeddedness.

Previous research has shown that the capability to manage the alliance can lead to an alliance-based competitive advantage. Herein, I have built the case for SDNM practices and concepts as the mechanism for developing alliance management capability. By actually building trust, sharing knowledge, identifying and combining complementary resources, investing in dedicated assets, and effectively governing the alliance relationship on operational, tactical and strategic levels, SDNM is an effective tool for an alliance management capability. Moreover, when the alliance function adopts a SDNO, through SDNM policies it will operationalize the goals and objectives of the function. Also, SDNM provides a better understanding of the internal resources

and what external resources are needed to complement them, thus leading to a better alliance partner selection.

The majority of trust problems arise due to members' decisions that the other parties might perceive as opportunistic behavior. However, by adopting SDNO and by incorporating SDNM into the alliance management capability activities and the alliance function, the effects of the decisions on other members are made visible and are hence better understood so that joint effort can be made to accommodate partners' interests in order to reach a system optimum instead of a single firm optimum. Indeed, SDNO and effective SDNM are critical for successful strategic alliances and this is the main premise of this chapter. Hence, the strategy field should recognize and adopt the contributions made by the SCM literature and, vice versa the SCM field should develop theoretical underpinnings, which the strategy field can provide.

Moreover, Processes required to combine, to configure and to manage synergistic resource combinations extend across multiple functional units within and across organizations. Therefore, achieving improvements in cost, time, quality, innovation and other generic competitive strategies, requires a holistic management of the existing interdependencies and complementarities. This holistic management style is required in order to achieve a fit between alliance partners on strategic, tactical and operational levels (Ireland et al., 2002). This is one way SDNM can help strategic alliances create competitive advantage. Another way, also identified by Ireland et al. (2002), is the effective management of the firm's portfolio of alliances. SDNM spans multiple levels, and thus can more effectively guide the portfolio building process by choosing alliance

partners more effectively because through SDNM practices the alliance management capability activities are realized and hence SDNM is best capable of understanding interdependencies and complementarities. SDNM can also better leverage the resources available through the alliance network because it manages the intefirm linkages and increases the awareness of the resources available throughout the network. Nonetheless, demand network managers must recognize that networks are complex adaptive systems and that they must balance strict purposeful design of the network and allowing the supply network to emerge autonomously in order to promote innovation and flexibility (Choi, Dooley, & Rungtusanatham, 2001; Eisenhardt & Galunic, 2000).

There are parallels in the alliance research in the strategy field and in the SCM field. Scholars in the strategy field seek to answer an old question, which is explaining how the resources and capabilities (within a firm, and for our purposes within the network) lead to competitive advantage? (Helfat & Peteraf, 2003; Sirmon et al., 2007), and throughout this dissertation, my goal is to show that SDNM, based on concepts proposed in the strategy field (Sirmon et al., 2007), is the mechanism that the strategy field can use to explain, for example, how RBV concepts for value creation can actually be implemented.

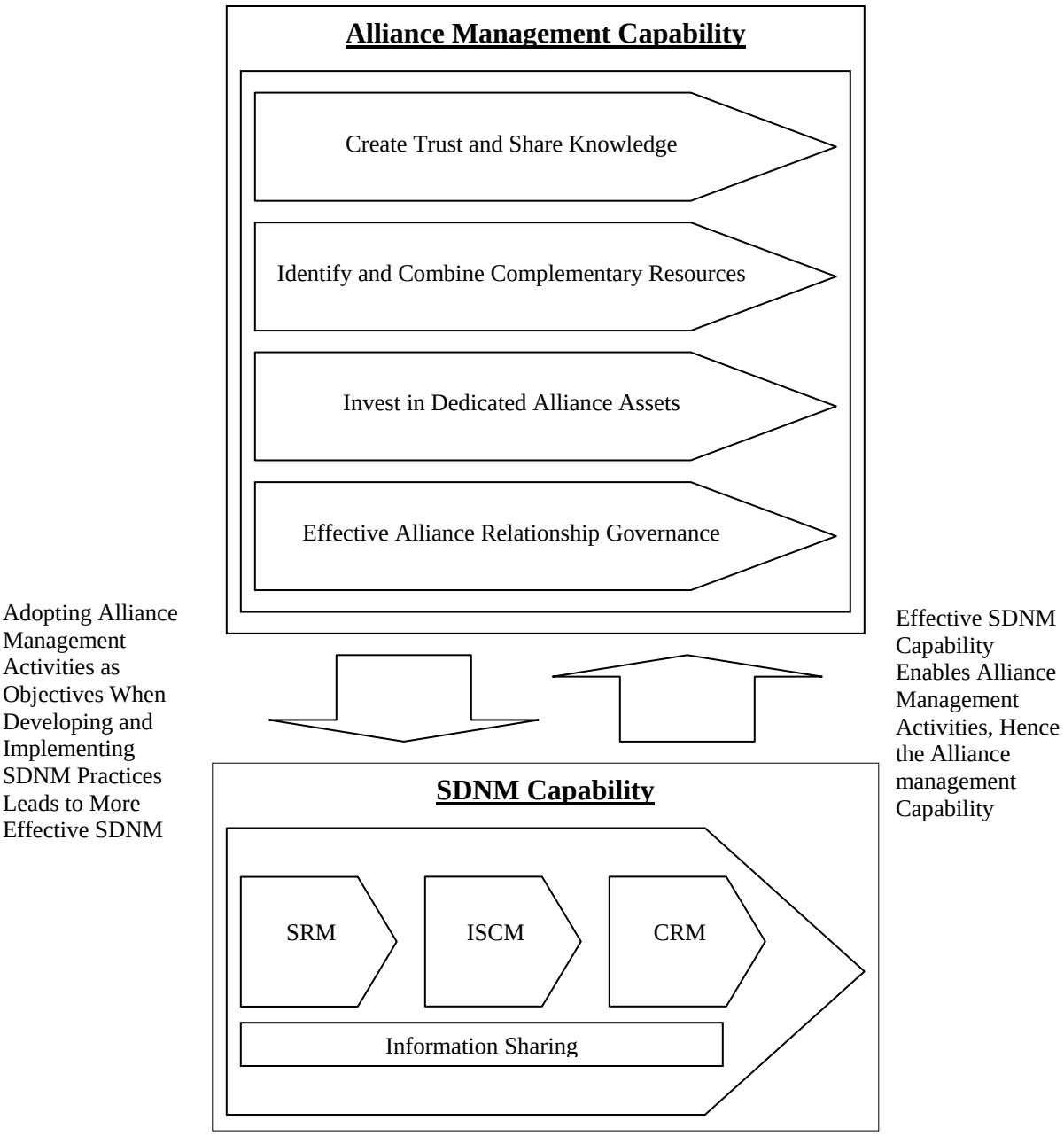
The goal in this chapter was to integrate two fields in order to develop a better understanding and gain a wider perspective on alliance-based competitive advantage. This work joins the call for more integration between the strategy and SCM fields because I believe that SDNM can operationalize a lot of concepts and constructs that are being proposed in the field of strategy. For example, a RBV of the firm and alliances is

often criticized for not outlining or explaining how resources actually lead to a competitive advantage and I believe that SDNM (SCM) practices which are involved in managing in an integrative manner the daily operations and processes that actually produce a product or a service, that directly affect the competitive advantage, can remove this criticism and provide the RBV with a realization mechanism. Figure 2 below shows the interaction between the alliance management capability and the SDNM capability. It indicates the reciprocal relationship between the two constructs and how they mutually support one another.

Indeed, SDNM offers the holistic management and the visibility of the network that can and will implement the corporate and firm strategies. On the other hand, strategy theories (TCT & RBV in particular) and alliance, network and social capital research from the strategy field give the SDNM practices a strategic objective, a purpose, a goal to pursue when developing and implementing these practices, and the means for evaluation (Grover & Malhotra, 2003), in order to reach and sustain competitive advantage beyond mere operational measures such as cost, speed, quality, etc. In other words, it provides the theory to guide its actions and plans, an often cited shortcoming of SCM.

FIGURE 2

Alliance Management Capability and the SDNM Capability



CHAPTER VI

STRATEGIC ENTREPRENEURSHIP (SE), SDNM, AND ORGANIZATIONAL BOUNDARIES

This chapter builds on the theories and arguments presented in previous chapters to integrate the strategic entrepreneurship (SE) construct with SCM research and the SDNM concept proposed in this dissertation in an effort to enable a more informed organizational boundary and supply chain design decisions appropriate for S.E. Small entrepreneurial firms, depending on the niche they decide to occupy within the value chain, often rely on external partners in order to obtain legitimacy, critical inputs for their innovative products, or to distribute their output (Alvarez & Barney, 2001). On the other hand, large entrepreneurial firms, although more financially capable, often depend on smaller partners for innovations and specialized capabilities in order to differentiate the end product. Therefore, establishing the most appropriate organizational boundary and managing the interfirm relationships effectively become critical capabilities that a firm needs to posses in order balance the exploration and exploitation goals of SE.

The boundaries of the firm constitute demarcation lines which separate the firm from the outside world. A firm's influence can reach beyond the firm, but its fiat and hierarchical authority usually are confined within its boundaries. Some processes span interfirm boundaries but the core competence of a firm and its specialized skills that it is known for should reside within its boundaries (Prahalad & Hamel, 1990). Thus, a firm's boundary defines it as a separate entity, both physically and socially. Also, deciding

what value chain activities to outsource, in-source or taper integrate (defined later) will have a significant effect on the firm's cost structure, its flexibility, and its ability to appropriate rent within the value chain.

"Rightsizing" the organizational 'processes', 'products' and 'people' is crucial to the firm's ability to compete during hypercompetitive times (Hitt et al., 1994). Hasty downsizing decisions and/or outsourcing decisions for short-term cash-flow and cost efficiency reasons can negatively affect the firm's long term competitive advantage and survival chances. They not only lead to lower morale among the employees and losing highly talented members but myopic outsourcing decisions can also lead to the loss of the ability to develop future capabilities (Barney, 1999; Hitt et al., 1994). Meanwhile, holding on to legacy processes that are outdated and inefficient could lead to inflexibilities; to an extent that a much praised jewel capability could turn into core rigidity that prevents a firm from seizing new opportunities (Leonard-Barton, 1992). Interdependent relationships in the organization need to be considered when deciding on the 'right size' and on the appropriate set of value chain activities to be involved in to avoid the disruption of a current, or impede the development of a future, core capability (Hitt et al., 1994).

Organizational boundaries also play a role in the firm's strategic flexibility. The new competitive landscape is described as "hypercompetitive" (D'Aveni, 1994; Hitt et al., 1998) because it is characterized by "escalating competition and strategic maneuvering" (Hitt et al., 1998: 23) due to rapid technological developments and increasing globalization. Price, lead-time, quality, innovation and satisfying customers'

complex needs have all become increasingly important for competitive advantage in such an uncertain global environment (D'Aveni, 1994; Hitt et al., 1998). For example, a firm's boundary that is in direct contact with the end customer better enables it to sense and respond to consumer taste changes. While a boundary that extends backwards, better enables a firm to sense and respond to changes in input technologies. Nonetheless, becoming involved in multiple stages requires greater investment, not only financial but also greater management attention, involvement, as well as greater administrative bureaucracy costs (D'Aveni & Ravenscraft, 1994) and may negatively affect a firm's strategic flexibility.

Moreover, different value-adding activities require different sets of know-how and capabilities that may or may not be readily available within the firm. Thus, in the face of this complex environment and myriad sources of uncertainty, firms need to use the latest technological developments, whether developed internally or accessed through strategic alliances, in order to create innovative products and services that can engender competitive parity, at least (Hitt et al., 1998). Therefore, not only do the transaction costs, resources and capabilities' endowments play a role in determining a firm's boundary but also does the knowledge-base and knowledge-absorptive capacity of the firm (Cohen & Levinthal, 1990).

The question of "why the firm exists?" or put differently "what leads to the creation of the firm instead of buying from the market?" has been popular in the field of economic organization since the first half of the 20th century. Those belonging to this school have addressed the transactions that occur between the firm and the market or the

firm and another firm through the prism of transaction costs economics (Coase, 1937; Williamson, 1975). Later in the 20th century, the concept of resource-based view of the firm emerged and it posits that firms are heterogeneous in their resources and capabilities' endowments (Barney, 1991; Conner & Prahalad, 1996; Wernerfelt, 1984). Along the same vein, Parahald and Hamel in their seminal 1990 work pointed out the importance of firm core competencies and how these competencies play a role in defining the firm, what is integrated and what is outsourced.

In sum, a firm's boundary decisions are clearly critical for a firm's ability to attain and sustain competitive advantage. In this chapter, I will endeavor to relate the SDNM capability to the organization boundary research (from the strategy field) and build the case for propositions that posit that SDNM can facilitate boundary decisions that match firms pursuing SE. Researchers warn against making hasty boundary decisions based on the operational level consideration only because they can unintentionally create dependencies that may negatively affect future flexibility (Insinga & Werle, 2000). However, it is at the operational level that the boundary decisions' goals are realized or missed. Hence, both the outsourcing and in-sourcing decisions must integrate both strategic and operational objectives and considerations (Insinga & Werle, 2000).

Therefore, I propose in this chapter that SDNM, a tactical capability that connects operations with strategies, is the best capability in enabling a more effective boundary decision that considers both operational and strategic intents for firms pursuing strategic entrepreneurship. The SDNM capability not only addresses direct capabilities

that are in-sourced or outsourced but can also serve as a locus for indirect capabilities that are ancillary to the core processes and activities (Araujo, Dubois, & Gadde, 2003).

A short literature review of the organizational boundaries subject is presented first, followed by a brief review of the SE construct. After that, I endeavor to elaborate on how SDNM practices can support the stages of strategic management of resources dimension and the innovation processes. These two concepts typify the exploitation and exploration activities, respectively, of SE. By linking SDNM with SE, I posit that SDNM can support and implement SE. Using a mainly resource based view (RBV) of the firm, the arguments linking SDNM to SE, and relaying on previous chapters, I endeavor to show SDNM practices' role in facilitating a more effective boundary decision for firms pursing SE. Finally, this chapter ends with a conclusion section.

6.1 Organizational Boundaries Literature Review

Firms decide to vertically integrate adjacent value stages for various reasons. Improved control of the interdependencies, transactional cost savings, identification with the whole firm, the creation of a system to share knowledge and experience and applying it (Ghoshal & Moran, 1996), better information flow, coordination and concentrated problem solving (Nickerson & Zenger, 2004), and more effective knowledge integration, are some of the claimed benefits of an effective vertical integration (Harrigan, 1986). On the other hand, excessive vertical integration can create core rigidities in the form of increased fixed asset investments that are not easily abandoned without incurring significant costs (Leonard-Barton, 1992). With large size comes a false sense of invincibility which can make a firm less cognizant of its smaller and more agile

competitors to the extent that it underestimates the effect of new innovative and competency destroying technologies being developed outside the firm on its competency and competitive advantage (Porter, 1980). Also, excessive vertical integration reduces the firm's flexibility (Harrigan, 1985a), and increases administrative and bureaucracy costs (D'Aveni & Ravenscraft, 1994).

Moreover, firms decide to vertically integrate upstream or downstream in hopes of reducing logistics costs, positioning the firm strategically to create entry barriers, developing capabilities and eventually capturing the profit margins of all the value-adding processes throughout the demand network. At the same time, excessive backward integration can deprive a firm of external suppliers' innovation processes and innovative products, from vast external knowledge sources, and from competitive pressure on internal suppliers to innovate. It also leads to inefficiencies due to lack of scale required to utilize large asset investments because internal demand may not amount to minimum efficient scales. These drawbacks are magnified as national economies become more global, as competition intensifies, and as products and processes become increasingly complex, and thus no one firm will have the knowledge base to master all technologies and know-how with equivalent proficiency (D'Aveni, 1994; D'Aveni & Ravenscraft, 1994).

The decision to vertically integrate can, depending on its effectiveness, lead to internal and competitive benefits and disadvantages. Eliminating redundant processes and assets, providing better view of inventories and capacities throughout the internal value chain to enable better coordination between interdependent activities, and savings

on negotiations, searching, and enforcing contracts are some of the internal benefits of vertical integration (Harrigan, 1984). The potential for synergy between the complementary and interdependent vertical stages, for control and market power, for higher differentiation due to involvement in multiple stages, and creating barrier entries for others while avoiding being held-up and/or locked-out are some of the competitive benefits of vertical integration (Harrigan, 1984).

On the other hand, vertical integration has disadvantages in the shape of internal costs and competitive dangers. It can result in higher internal coordination costs, and "poorly organized vertically integrated firms do not enjoy synergies that compensate for higher costs" (Harrigan, 1984: 639). Exit and mobility inflexibilities, core rigidities, insisting on inefficient legacy systems beyond their use due to the large initial investment, lower competitive pressure on internal units, and lower exposure to new technologies developed by specialized suppliers and customers are some of the potential competitive dangers of vertical integration (Harrigan, 1984). Therefore, although vertical integration is necessary at certain stages of the industry lifecycle, it can be the wrong strategy under different circumstances. Knowing when to vertically integrate and when to disintegrate is a competitive capability that can lead to successive temporary competitive advantages adding up to sustained competitive advantage (Fine, 1998, 2000).

The question of which stages of the value chain (scope) should a firm be involved in defines the firm and determines its specialty (Coase, 1937). Entrepreneurs have to answer this question before they can successfully launch their new business and

established firms have to decide the value chain stages to in-source and/or outsource on a continual basis as conditions change. Keeping a process in house when a supplier can perform it at lower costs, superior quality and higher differentiation can lead to competitive disadvantage against competitors who utilize specialized suppliers (Leonard-Barton, 1992). On the other hand, excessively depending on suppliers for critical components can put the buying firm in a vulnerable position if the supplier behaves opportunistically and enters the buyer's value chain stage. Or the supplier can be 'held-up' by the buyer when the buyer reneges out of a deal that requires substantial relationship-specific investment by the supplier (Williamson, 1975, 1985). Moreover, hollowing-out the firm, for different immediate and short-term competitive reasons, can adversely affect a firm's ability to develop future capabilities (Teece et al., 1997). This is especially true when future capabilities are developed in a path-dependent manner based on current know-how and consequent learning experiences.

Numerous studies, using different theories, have tried to examine how a firm's boundary is determined and how it evolves (Afuah, 2001; Araujo et al., 2003; Argyres, 1996; Barney, 1999; Coase, 1937; D'Aveni & Ravenscraft, 1994; Davis & Duhaime, 1992; Eisenhardt & Galunic, 2000; Fine & Whitney, 1996; Fine, 1998; Gilley & Rasheed, 2000; Harrigan, 1984, 1985b, 1985a, 1986; Hitt et al., 1998; Holcomb & Hitt, 2007; Insinga & Werle, 2000; Penrose, 1959; Quinn, 1999; Quinn & Hilmer, 1994; Rothaermel et al., 2006; Williamson, 1975, 1985). In fact, a firm being involved in multiple value chains can have multiple boundaries depending on the stage it occupies on a certain product's value chain (Fine, 1998; Fisher, 1997). These boundaries are not

static and shift with time as activities are outsourced and/or integrated (Araujo et al., 2003). Moreover, a firm's boundary at the product level is not necessarily identical to its capabilities and knowledge boundaries because firms often need to know how their products and processes fit with complementary components or processes even if they were produced or carried out externally (Araujo et al., 2003). Thus, it is important to be able to manage the boundaries dynamically and know how different capabilities complement one another.

Furthermore, the level of vertical integration affects the firm's adaptability to new technologies and new market conditions (Fine, 1998, 2000). When components making up the product are highly interdependent, and provide scale economies, then it is expected that the vertically integrated firm would out-perform a decoupled chain in achieving efficiency and adaptability because it is easier to coordinate the changes within the firm (Christensen, 1994; Fine, 1998; Stuckey & White, 1993). However, when components are modular, standardized, and do not provide scale economies, a decoupled chain can out-perform the vertically integrated firm because it can access new technologies and accelerate the design and launch cycle (Christensen, 1994; Fine & Whitney, 1996; Fine, 1998).

Vertical integration approaches can be divided into four alternatives: nonintegration (outsourcing), quasi-integration (cooperative ventures), taper integration (integrate and outsource a portion in parallel), and full integration (Harrigan, 1984). Each alternative has its advantages and disadvantages. For example, nonintegration is often used for none-core components, quasi-integration is used for flexibility reasons

and as a means for accessing information and gathering market intelligence. Taper integration is used to protect the firm against strikes and disruptions within the value chain, and full integration is used to protect against uncertainties and to economize on transaction costs.

In the following paragraphs, I will try to present a brief review of some of the theories that have tried to explain organizational boundary decisions but the focus will be on the two most common paradigms for addressing vertical integration questions: the Transaction Cost Theory and the Resource-Based View. Of course, the latter will be drawn upon more heavily for its relevance to the SE and the SDNM concepts.

6.1.1 Transaction Cost Theory (TCT) and the five forces

Coase's 1937 work "the nature of the firm", might very well be the first academic work to pose the firm's boundary question based on transaction cost economics. Transaction cost theory (TCT) bases the integration and disintegration decision on the economic cost of conducting a transaction. If a process can be carried out in-house at a lower cost, then, according to TCT it should be brought in (Coase, 1937). On the other hand, if a process can be performed for a lower transaction cost outside the firm, then it should be contracted from the market. The transaction costs are costs related to search costs, negotiation costs, contract writing costs, specification setting costs, monitoring costs, enforcement costs, and dispute resolution costs (Coase, 1937; Williamson, 1975, 1985).

The degree of asset specificity, frequency of the transaction, and uncertainty are all individually and in combination positively related to transaction costs (Grimm, 2008;

Williamson, 1985). The more specific is an asset to a relationship, the less likely it will be as valuable in another relationship, e.g., site specificity. The transaction cost of a specific asset increases further under conditions of high uncertainty, which often exacerbate the risk of opportunistic actions.

Moreover, market exchange uncertainty, fear of partner opportunism ('hold-up'), and bounded rationality are some of the factors that increase the market transaction costs (Holcomb & Hitt, 2007). The costs of these factors are even higher when relationship-specific assets are involved in the transaction because the customer/supplier assets are less valuable (or of no value) outside a specific relationship (Klein et al., 1978; Williamson, 1975). Also, when buyer-supplier dependencies are high, the costs of opportunistic behavior are higher because an opportunistic action by a supplier, for example, might leave the buyer unable to deliver its products on time, i.e. operate. Bounded rationality refers to the limits of the human being's ability to discern complex situations (Simon, 1957). It leads to his inability to forecast alternatives, consequences and future events (Adner & Helfat, 2003), and consequently increases transaction costs.

Even further, if a partner is able to absorb the focal firm's core competency, know-how and make a move into the firm's vertical stage niche, it would mount serious competition against the focal firm. Hence, the basic premise of TCT is the emphasis on governance structure economization in response to market-based transactions costs, where governance "is the mechanism through which a firm manages an economic exchange" (Barney, 1999: 138). The three categories of governance mechanisms are

‘market governance’ (arm’s-length), ‘intermediate governance’ (contracts and alliances), and/or ‘hierarchical governance’ (within the firm) (Barney, 1999).

Holcomb and Hitt (2007) concisely describe three sources of transaction-based cost: “Asset specificity”, “Small numbers bargaining”, and “Technological uncertainty”. The subject of dedicated specialized assets and their role in productivity improvement was elaborated on in the previous chapter and has been extensively covered in the literature (Dyer, 1996a; Dyer, 1996b; Dyer, 2000; Dyer & Hatch, 2006). These relationship-specific assets carry less value outside the original relationship and carry considerable risk of ‘hold-up’ (Klein et al., 1978). They usually represent the culmination of a strategic relationship between two firms indicating high trust and interdependency. Therefore, the break up of a relationship may leave the partner that made the large upfront investment in such dedicated specialized assets unable to efficiently redeploy them to other uses (Williamson, 1991a). For example, a dedicated facility located near a preferred customer is such an asset that greatly loses value if the customer decides to drop the focal supplier for another one (Williamson, 1985). Nonetheless, relationship-specific assets can lead to improved quality, performance and coordination (Dyer, 2000; Dyer & Singh, 1998; Williamson, 1985). In the case of a dedicated facility for example, transportation costs and communication costs are reduced and employees have a higher chance of developing personal relationships, hence relational capital with strategic alliance partners (Dyer & Singh, 1998).

Small numbers bargaining refers to the situation where there are very few suppliers or customers with the specialized skills necessary to the focal firm’s business.

This creates higher switching costs and increases the risk of being locked into a relationship with an inefficient partner due to the lack of competitive alternatives (Klein et al., 1978; Monteverde & Teece, 1982; Williamson, 1975). In competitive markets, partner firms vie for scale and will hesitate to act opportunistically for the fear of being dropped for another firm, which can be done without significant loss in value and rather easily. Therefore, lower density of specialized firms grants these firms more bargaining power, who in turn can appropriate more rent from the relationship at the expense of the outsourcing firm (Holcomb & Hitt, 2007). Bargaining power can be used to persuade partner firms without direct ownership, but when a firm loses its bargaining power, it might be inclined to bring those value chain stages inside the firm to protect itself (Harrigan, 1984, 1985a).

The third subject often discussed under TCT is the uncertainty in demand, supply, and technology. In the presence of uncertainty, firms that make large investments face higher risks of asset obsolescence, thus encouraging firms to outsource some operations (Harrigan, 1986). However, excessively high levels of uncertainty will lead to an environment conducive to opportunistic behavior by specialized partners (Holcomb & Hitt, 2007). Therefore, Holcomb and Hitt (2007) propose an inverted U-shaped relationship between 'strategic' outsourcing and technological uncertainty. Harrigan (1984) also posits that rapid changes in technology must be matched by different vertical integration strategies depending on the firm's objective of being a pioneer or a follower. She posits that when technology is still uncertain in early stages

of the industry, a follower firm should outsource more but increasingly integrate later to benefit from scale.

The emphasis under the TCT on integration and transaction economics sometimes misses the danger of strategic inflexibility that might result due to shared facilities, specific-assets and interdependent knowledge bases (Arrow, 1975; Coase, 1937; Harrigan, 1985a; Williamson, 1975). And the vertical integration strategies that a firm follows differ in their degree, their stages, their breadth and form (Harrigan, 1985a, 1986). They vary based on the demand characteristics, industry competitiveness level, need for control of adjacent stages, and corporate strategy requirements (Harrigan, 1985a, 1986).

Moreover, in his 1980 book, Michael Porter presented the five forces that influence an industry and play a role in determining firm boundaries. When the industry environment is stable for example, firms prefer internal transactions (Harrigan, 1986). This is because the five forces of industry rivalry, supplier power, buyer power, barriers to entry and the threat of substitutes affect a firm's rent appropriation ability. For example, fear of buyer and supplier power abuses encourages the firm to move into the following or the preceding stage in order to protect its share of the profit. Also, barriers to entry make it more difficult for new firms to enter the industry, thus giving the firms in the industry the space and time to invest and grow, especially under low exit barrier conditions (Harrigan, 1986).

In addition, when demand, supply, and technological uncertainties are high and change frequently, it is much riskier to be involved in multiple levels of the value chain

(Afuah, 2001). However, a firm can capture greater rents if it is involved in and influences a new upstream or downstream technology that succeeds to dominate other technologies. According to Harrigan (1986), demand and infrastructure uncertainty, competitive volatility, bargaining power and asset exposure, and corporate strategy concerns also play a role in determining the appropriate vertical integration posture. Because the bargaining power of the various players within the vertical value chain shifts back and forth, the SDNM practices can clearly play a positive role in manipulating and utilizing these shifting relationships to make the best integration decision.

As such, transaction costs have very important implications for the firm's ability to design, deploy, and manage the optimal demand network which is dynamically evolving (Afuah, 2001; Grimm, 2008). This ability is a capability that can and does lead to achieving and sustaining competitive advantage (Chen & Paulraj, 2004; Fine, 1998). Once a firm decides on the network design, then it can use TCT recommendations to determine the nature, length and amount of investment in each specific interfirm relationship. TCT addresses contract design in order to assure adaptability and in order to lower transaction costs (Williamson, 1975, 1985). In sum, TCT has greatly contributed to the organizational boundary research and the strategy field and must be considered in organizational boundary related research. Because I posit SDNM (SCM) as a key element of strategy implementation that directly addresses interfirm relationships and demand network management, TCT has much to offer to the SCM field.

However, is transaction cost the only factor considered by the firm when it seeks to determine its optimal organizational boundary? Indeed it is a given that in these hypercompetitive times, few companies can develop internally all technologies needed to differentiate their products even if external transaction costs are high (Chesbrough & Teece, 1996; D'Aveni, 1994). Thus, although firms may incur higher transaction costs, often firms have no alternative but to use an outside supplier until it can develop a capability internally. Therefore, next we will consider the Resource-Based View of the firm. It takes into account the firm's resources when determining the firm's boundaries and the sources of competitive advantage.

6.1.2 Resource-Based View (RBV)

The TCT of the Industrial Economics field did not consider firms' desire for technological leadership, secure access to raw material, and preemptive competitive moves. Moreover, synergy benefits of transaction between independent firms are also not addressed in TCT (Williamson, 1975). Frequently, firms determine their boundaries for reasons additional to those only attributed to TCT (Argyres, 1996; Barney, 1999; Holcomb & Hitt, 2007). In fact, corporate strategy plays a role in the vertical integration and resources and capabilities decisions (Harrigan, 1985a). Determining the 'right' firm boundary is a competitive strategy that significantly affects not only the firm's ability to obtain competitive advantage but also its ability to survive. Therefore, firms in reality take into account TCT concepts (Williamson, 1975, 1985), as well as external factors such as the market, the competitors and the firm's position within the market (Porter's five forces) (Porter, 1985a), strategic choices, and internal factors (resources and

capabilities) (Barney, 1995; Hayes et al., 2005) when determining the best competitive strategies, among which is the boundary strategy.

To state it differently, besides TCT and the five forces posited by Porter (1980) firms also look inside their organization when determining the firm's optimal boundary (Barney, 1999). RBV posits the heterogeneity of firms within an industry and that the resources that the firms own, control, and are able to access and manipulate are critical for creating capabilities that lead to obtaining and sustaining competitive advantage (Barney, 1991; Wernerfelt, 1984). Thus, a firm's resources and capabilities play a role in determining its boundaries (Argyres, 1996; Barney, 1999; Jacobides & Hitt, 2005) and its ability to implement strategies and gain and sustain competitive advantage (Hitt et al., 2005). Because firms have different endowments of resources and capabilities, and because critical specialized resources and capabilities develop in a path-dependent manner, firms sometimes need to access certain capabilities that lay outside the firm (Chesbrough & Teece, 1996; Das & Teng, 2000a). Hence, it becomes important to be able to effectively access these resources from the intermediate market.

If a firm does not own a set of capabilities necessary for its products' ability to be competitive then it will have to access those capabilities through: 1) either market or intermediate governance mechanisms or 2) through hierarchical governance by developing the capability inside the firm or acquiring another firm which has the capability (Barney, 1999). These resources have to be valuable, rare, inimitable, and non-substitutable (VRIN) for them to be able to give the firm competitive advantage (Barney, 1991).

And because firms operationalize competitive strategies through combining and deploying unique combinations of resources that may exist within the firm and/or outside the firm, it is critical that the firm has the capability to identify and manage the resource complementarities within the demand network (Rothaermel, 2001). While in the past the case was always made to outsource noncore capabilities, in recent times outsourcing is promoted in order to enable "*rapid organizational change, to launch new strategies and to reshape company boundaries"* (Linder, 2004: 52). Indeed, more often than not, companies lack complementary skills and capabilities critical for competitive advantage. Therefore, I propose in this work that SDNM, which strives to manage the operational complementarities that exist within and outside the firm, can indeed lead to more effective boundary decisions. The effective management of the outsourcing relationship can make the difference between the success and the failure of the outsourcing decision (Mullin, 1996; Quinn, 1999; Quinn & Hilmer, 1994). Moreover, SDNM can help create relational capital and facilitate the strategic management of resources, a process critical to SE, thus enabling better management of the outsourcing relationship for entrepreneurial purposes (Dyer & Singh, 1998; Ireland, Hitt, & Sirmon, 2003).

Hence, the RBV's main boundary premise is that firms take into consideration their resource and capability endowments and the need for complementary resources and capabilities when determining the organizational boundary (Argyres, 1996; Barney, 1999). Hence, in reality firms consider not only transaction costs when determining boundary decisions, but also consider the resources and capabilities development and

deployment (Combs & Ketchen, 1999; Jacobides & Winter, 2005; Williamson, 1999). Under RBV, firms assess internal capabilities and resources and scan the internal and the external environment to determine the complementarities that create unique and differentiating value and determine how to configure, integrate and manage these complementarities (Holcomb & Hitt, 2007; Teece et al., 1997).

Therefore, firms may insource or outsource (vertically integrate or disintegrate) based on the need for specialized capabilities in order to create valuable, rare, immobile and non-substitutable (VRIN) combination of resources and capabilities (Fine & Whitney, 1996; Fine, 1998; Holcomb & Hitt, 2007; Jacobides & Hitt, 2005). Holcomb and Hitt (2007) present four resource-based considerations for the value of capabilities in strategic outsourcing relationships. They are: 1) 'complementarity of capabilities', 2) 'strategic relatedness', 3) 'relational capability-building mechanisms', and 4) 'cooperative experience'. These considerations can clearly relate to SDNM concepts on one hand, and can be facilitated by SDNM on the other hand. Indeed, in this research, SDNM's role in enabling more effective boundary decisions stems from the RBV of organizational boundaries.

Furthermore, capabilities that can provide competitive advantage are usually not readily available in the strategic factor markets (Barney, 1986). Instead they are costly to create for the following reasons according to Barney (1999):

1) The capability requires particular historical context that may not be available anymore, i.e. "being at the right place and the right time."

2) The capability is created in a path-dependent manner (learning process).

3) The capability is created and exists in a socially complex environment "cultural competitiveness" (Hult et al., 2002).

4) The capability is created in a causally ambiguous manner, which makes it difficult for others to discern and copy.

These reasons hinder a firm's ability to develop specialized capabilities when it may need them to complement other internal core competencies. As a result, a firm may resort to acquiring firms with the desired capabilities. However, acquiring a whole firm for a specific or a set of specialized capabilities is not a smooth process and more often than not does not result in economic gains for the acquirer (Barney, 1988; Capron & Pistre, 2002; Harrison et al., 1991; Hayes et al., 2005; Karim & Mitchell, 2000; Lei & Hitt, 1995; McEvily & Marcus, 2005; Zollo & Leshchinskii, 1999). Acquisitions usually entail paying more than needed because it leads to buying and taking over entire firms while only a portion of resources or capabilities may actually lead to value creation (Hitt, Harrison, & Ireland, 2001a; Hitt, Ireland, & Harrison, 2001b). Because of the above, firms end up seeking external partners with unique and specialized capabilities even if the threat of opportunism is present (Barney, 1999). This is especially true in the case of fast-pace high technology industries because of the lack of know-how and the amount of intensive path-dependent knowledge investments often required.

Hence, resources and capabilities do in fact play a critical role in determining the firm's boundaries. The firm that is able to determine the most appropriate boundary,

dynamically shift the boundary and is able to effectively manage the complementarities between independent firms will be more effective in obtaining and sustaining competitive advantage. Thus, the TCT, the five forces and the RBV should be taken as complementary when determining the firm's boundary in pursuit of competitive advantage. Moreover, in this work, an effort will be made to integrate SDNM and SDNM practices with the strategic management of resources' and innovation dimensions of the SE construct in order to enable more effective boundary decisions. Specifically, an effort will be made to apply the results of this integration to the concept of SE, using RBV as an underpinning, in pursuit of the most congruent firm boundaries. A literature review of SE is presented next.

6.2 Organizational Boundaries and Competitive Advantage

"Involvement in many stages of integrated activity cannot be sustained throughout the entire life of an industry with equal success" (Harrigan, 1986: 553). Therefore, determining the scope and organizational boundaries of the firm are critical to its ability to gain and sustain competitive advantage (Jacobides & Winter, 2007). Indeed, being involved in a vertical stage that requires substantial capital investment and demands significant management involvement yet produces non-strategic inputs (i.e., generic inputs that do not differentiate the end-product), and has no clear future core competency building potential, while competitors rely on external best-in-class specialized suppliers, will negatively affect the firm's ability to gain competitive advantage (Prahalad & Hamel, 1990; Quinn, 1999; Quinn & Hilmer, 1994).

On the one hand, excessive vertical integration can create rigidities that render the firm inflexible and unable to adapt to environmental changes (Chesbrough & Teece, 1996; Shimizu & Hitt, 2004). On the other hand, hasty outsourcing decisions can create dependencies that hinder the firm's ability to create internal strategic core competencies in the future and leave it vulnerable to partner opportunism (Bettis, Bradley, & Hamel, 1992; Holcomb & Hitt, 2007; Insinga & Werle, 2000; Lei & Hitt, 1995; Rothaermel et al., 2006). Hence, it is important that the designing and developing of new products and processes also be accompanied by the appropriate supply chains (i.e. demand networks) (Fine & Whitney, 1996; Fine, 1998, 2000; Fisher, 1997).

Researchers and practitioners have concluded that organizational boundaries are not static and that they extend or retract dynamically depending on the industry age, technological and demand uncertainty, and core competency objectives (Fine & Whitney, 1996; Fine, 1998, 2000; Harrigan, 1985a, 1986). In fact, Fine (1998, 2000) posits that the ultimate core competency is the ability to decide what resources and capabilities to invest in, to develop, to outsource or to acquire that can provide the highest value given the industry's evolution speed. Moreover, Fine (1998, 2000) introduces the concept of industry clockspeed-based strategies attributed to the fact that different industries evolve and move at different speeds, for example, high tech industries develop at a faster rate (faster clockspeed) than the mature 'metal-bending' industries. The life cycle of products, processes, and organization forms vary between industries. Hence, a product, a process, and an organization, that individually or collectively provide(s) a competitive advantage today may not provide even competitive

parity at a later stage of the industry evolution (Fine, 1998). For example, an innovative product requires an agile supply chain in the introduction and growth stages of its lifecycle to obtain first mover advantage but a lean supply chain in its maturity and decline stages when competitors introduce similar products (Vonderembse et al., 2006).

Therefore, the ability to decide which set of capabilities to develop and which to outsource in the process of designing the supply chain (i.e. demand network) is the ultimate core competency in a fast-clockspeed world according to Fine (1998). This competency also means (re)designing and (re)configuring the demand network on a continuous basis in order to gain a series of temporary competitive advantages in pursuit of a sustainable competitive advantage (Fine, 1998). As a result, a firm may integrate a capability to only outsource it at a later date and vice versa (Fine & Whitney, 1996; Fine, 1998, 2000). Ford Motor Company, for example, started as a vertically integrated firm but now heavily depends on suppliers. Similarly, Toyota historically depended on Nippondenso for electronic inputs but as electronic components' contribution to the end-product selling price increased, Toyota has been interested in pursuing some internal electronic competency development (Fine & Whitney, 1996).

Being able to efficiently and effectively shed unnecessary for competitive advantage stages and processes and being able to move into new vertical stages (i.e. develop a new capability) when deemed necessary is critical for creating strategic flexibility and has become a necessary competency in the hypercompetitive era (Aggarwal, 1997; Brown & Eisenhardt, 1997; Brown & Eisenhardt, 1999; D'Aveni, 1994; Harrigan, 1980; Hitt et al., 1998; Shimizu & Hitt, 2004). Novel organizational

forms have been the subject of increasing research in pursuit of the organizational structure that provide adaptability, flexibility, and time advantage in the face of changing markets (Brown & Duguid, 1998; Brown & Eisenhardt, 1997; Brown & Eisenhardt, 1998; Eisenhardt & Brown, 1998; Eisenhardt & Galunic, 2000; Eisenhardt & Martin, 2000; Galunic & Eisenhardt, 2001; Iansiti & Clark, 1994; Lewin, Long, & Carroll, 1999; Volberda, 1996).

Outsourcing, specifically, 'strategic outsourcing' that is developed and managed well has been shown to "lower costs, risk, and fixed investments while greatly expanding flexibility, innovative capabilities, and opportunities for creating higher value-added and shareholder returns" (Quinn, 1999: 10). At the same time, a firm that relies heavily on outsourcing can be subject to 'strategic hazards' (Chesbrough & Teece, 1996). And it risks gradually loosing the internal capabilities necessary to create the knowledge base required to understand and absorb external capabilities, and the ability to coordinate and integrate for innovation (Chesbrough & Teece, 1996). This is especially true for 'systemic' innovation which in contrast to 'autonomous' innovation depends on complementary innovations for its innovative value to be realized (Chesbrough & Teece, 1996).

In response to shareholder pressure and global competition, corporate CEOs have rushed to outsourcing in order to lower costs and achieve higher return on assets in hopes of doing more for less (Gilley & Rasheed, 2000). Nonetheless, aggressive outsourcing can result in long-term costs that dwarf any short-term cost savings. A firm could lose its research and development (R&D) innovative edge if it substitutes

outsourcing for internal innovation (Teece, 1986). In addition, bringing an outsourced process efficiently inside and creating a competitive advantage with it is a difficult process that might never be realized if the firm was not diligent (i.e. didn't preserve know-how) when it made the initial outsourcing decision (Dess et al., 1995; Gilley & Rasheed, 2000). It is clear that the decision to vertically integrate a value-chain stage or outsource it has an impact not only on the current competitive advantage chances of the firm but also may significantly affect the firm's future core competencies and competitive advantage potential.

Moreover, vertical integration and outsourcing are not the only forms of organizing. In fact, they represent the two extremes of centralization and decentralization along a continuum that includes other forms of organizing, such as alliances, taper integration, strategic outsourcing, joint ventures and long-term contracts. Integration and outsourcing processes require the involvement and coordination of various strategic business units (SBUs) that often work to meet their individual objectives, which at times conflict with other SBUs' best interest. Therefore, the vertical integration strategy is a **corporate strategy** that rests in the hands of the corporate CEO and top management who solely can, at times, dictate and push for coordination among the SBUs (Harrigan, 1984, 1985a).

From the above discussion we can conclude that the organizational form a firm chooses is extremely important to its ability to gain and sustain competitive advantage. This is even truer for firms pursuing SE. Whether the innovation is autonomous or systemic, a competency in 1) comprehending the effect of vertical integration or

outsourcing, on all the related and complementary processes, 2) in managing, and 3) in adopting the innovative process throughout the demand network is required to enable SE to create competitive advantage and consequently create value and wealth. According to Ireland et al. (2001), competitive advantage results from 1) a unique industry position (Porter, 1979, 1980), 2) effective use of VRIN resources and capabilities (Barney, 1991; Sirmon et al., 2007), and 3) membership in a cooperative network or alliance (Dyer & Singh, 1998).

Competitive advantage does not depend on the external forces or internal resources independently, instead, a firm seeking competitive advantage should consider both internal and external factors when devising a plan to gain competitive advantage (Teece et al., 1997). Thus, the resource positions of the firm, i.e. resources and capabilities owned and accessed by the firm, complement the product market positioning theory to explain competition between firms (Barney & Arikan, 2001; Ireland et al., 2003). Moreover, the mere resource endowment falls short in explaining why certain firms outperform others (Sirmon, Gove, & Hitt, 2008). Therefore, how these resources, which extend organizational boundaries, are managed has a direct effect on the firm's ability to gain competitive advantage (Sirmon & Hitt, 2003; Sirmon et al., 2007). Strategic management of resources to induce innovation and enable SE is even more conducive to competitive advantage in the new competitive landscape characterized by hypercompetition. SDNM is a capability that connects operational levels, where innovation actually occurs, with strategic levels and synchronizes the strategic and operational factors when managing resources strategically. Such consideration has clear

implications for effective vertical integration or disintegration decisions, in a manner that considers both internal and external factors. Next a literature review of SE is presented.

6.3 SE Literature Review

Entrepreneurship is the exploitation of business opportunities by reconfiguring existing resources (internal or external) and deploying them in a unique new combination that addresses a market need in a differentiated way, or creates a new market using novel combinations of complementary capabilities, or even creates new capabilities (Alvarez & Barney, 2001; Drucker, 1985; Hitt et al., 2001c; Ireland et al., 2001; Ireland et al., 2003; Ireland & Webb, 2006; Jacobides & Winter, 2007; Meyer, Neck, & Meeks, 2002; Schumpeter, 1934). Entrepreneurship can entail the creation of a new firm, the creation and the introduction of a new product and/or service, the development of a new supply source, the identification of an unmet market need or the creation of a new market, and/or the development of a new production technology (Hitt et al., 2001c; Schumpeter, 1934) in pursuit of innovation, growth and wealth.

Hitt et al. in their guest editors' introduction to the Strategic Management Journal's special issue on entrepreneurship define entrepreneurship as "the identification and exploitation of previously unexploited opportunities" (2001: 480). And Ireland et al. define entrepreneurship "as a context-dependent social process through which individuals and teams create wealth by brining together unique packages of resources to exploit marketplace opportunities" (2001: 51). From the above definitions it can be concluded that the ability to access and combine resources and know-how, and to

reconfigure and leverage them in a unique value creating manner are the core competencies required for entrepreneurship (Ireland et al., 2001; Sexton & Bowman-Upton, 1991). This know-how is a tacit capability that is embedded in a social context which can't be easily copied (Barney, 1991).

Nonetheless, in this era of competence destroying hypercompetition filled with uncertainties, entrepreneurial firms need to take strategic actions in order to exploit the opportunities, create value and appropriate the benefits of their innovations (Hitt et al., 2001c, 2002a). Therefore, scholars have introduced the concept of SE which integrates the complementary fields of entrepreneurship, which seeks opportunities, and strategic management, which seeks competitive advantage, in order to enable the firms to realize entrepreneurial strategies and tackle the twenty-first century competitive landscape (Hitt et al., 2002a; Ireland et al., 2001; Ireland et al., 2003; McGrath & MacMillan, 2000; Meyer & Heppard, 2000; Venkataraman & Sarasvathy, 2005). The strategic management process "is the full set of commitments, decisions, and actions required for a firm to achieve strategic competitiveness and earn above-average returns" (Hitt, Ireland, & Hoskisson, 2005: 5). As such, SE endeavors to enable the firm to identify "the best opportunities (matched with their resources and with the highest potential returns) and then to exploit them with the discipline of strategic business plan" (Hitt et al., 2002: 13).

A firm uses entrepreneurial actions to sense, identify and exploit an entrepreneurial opportunity that economically justifies introducing a new product, service and/or a new organization (Alvarez & Barney, 2001; Ireland et al., 2001; Shane

& Venkataraman, 2000). Strategic actions on the other hand enable firms to "develop and exploit current competitive advantages while supporting entrepreneurial actions that exploit opportunities that will help create competitive advantage for the firm in the future" (Hitt et al., 2002: 2). One emphasizes the exploitation and creation of growth opportunities, while the other focuses on the performance of the firm while exploiting those opportunities (Meyer et al., 2002). Thus, strategic entrepreneurship is "the integration of entrepreneurial (i.e., opportunity-seeking behavior) and strategic (i.e., advantage-seeking) perspectives in developing and taking actions designed to create wealth" (Hitt, Ireland, Camp, Sexton, 2001: 481).

Strategic management and entrepreneurship share several domains according to Hitt and Ireland (2000), Hitt et al. (2001) and Ireland et al. (2001). These domains are: 'innovation', '(external) networks', 'internationalization', 'resources and organizational learning', 'top management teams and governance', and 'growth'. Each of these domains is pertinent to both strategic actions and entrepreneurial actions and each of these has been extensively researched in their own right. Innovation in particular has been posited to be the primary activity and outcome of entrepreneurship (Drucker, 1985) and as the key part of strategy in uncertain times (Hamel, 2000). External networks are specially related to the concept of SDNM and it is the domain where SDNM can provide the mechanisms for both strategic and entrepreneurial actions. Networks also have an effect on the other domains and can be a source of entrepreneurial ideas, entrepreneurial actions and entrepreneurial profits (Powell et al., 1996). Moreover, external networks

are essential for collaborative innovation where ideas and knowledge are shared between network members pursuing SE (Ketchen, Ireland, & Snow, 2007).

Complementary resources and capabilities needed for competitiveness and value creation lay not only inside the firm but, more often than not, they lay outside the firm (Dyer & Singh, 1998; McEvily & Zaheer, 1999; Rothaermel, 2001). In this era of network versus network competition, entrepreneurial firms should seek to combine and reconfigure resources and capabilities which lie within the firm with complementary resources and capabilities that exist beyond the firm's boundaries within other firms, i.e. outside the firm's boundary of authority (Doz & Hamel, 1998). And because social networks play a vital role in developing and cultivating new venture ideas that often result from interactions between network members, networks are a significant source of entrepreneurial opportunities and resources required to exploit these opportunities (Cooper, 2002).

Indeed social networks create a higher degree of embeddedness, which motivates partners to invest in relationship specific assets, and to accommodate and adapt to contingencies in a manner beneficial to all partners (Uzzi, 1997). Moreover, embeddedness leads to the development of partner-specific knowledge which provides a better understanding of partners capabilities and facilitate the transfer of knowledge and the exploitation of the entrepreneurial ideas (Cooper, 2002; Uzzi, 1997). SDNM capability, a business strategy that spans both strategic and operational levels within and across the network firms, has clear implications for managing the network interrelationships in a manner that is both strategic and entrepreneurial (Dyer & Singh,

1998). In addition to innovation and external network domains, SDNM can also have implications in the resource and organizational learning domain. However, the external network domain will be the entry point to show the role SDNM can play in facilitating SE and the boundary decisions made under the SE construct. Undeniably, SDNM capability, through the SDNM practices, is well suited to facilitate entrepreneurial actions to identify and combine synergistic resource combinations and exploit new entrepreneurial value-creating opportunities that exist within the network.

Next, I will discuss the components of resource management proposed by Sirmon et al. (2007) and the relationship between them and SE as proposed by Ireland et al. (2003). Accepting their proposition that strategically managing resources is an important dimension and an antecedent of SE, I will integrate the management of resources dimension with the SDNM concept and practices and show their role in facilitating the strategic management of resources. After that and in line with the SE literatures which attempts to integrate strategic actions with entrepreneurial actions in order to successfully create wealth from entrepreneurial ideas, SDNM practices are integrated with the concept of innovation. By the end of sections 6.4, 6.5 and 6.6, the hope is that the reader can appreciate the critical role the SDNM capability and SCM field in general can play in facilitating SE.

6.4 Strategic Management of Resources

In their 2007 work, Sirmon et al. address the common criticism of the RBV, that is, the RBV's insinuation, according to the critics, that the mere possession of VRIN resources guarantees the creation of value or the obtainment and sustainment of

competitive advantage (Barney, 1991, 2001; Barney & Arikan, 2001; Priem & Butler, 2001a, 2001b; Sirmon et al., 2007; Wernerfelt, 1984). Sirmon et al. (2007) present a resource management model to show that in order for the firm to be able to create value and gain competitive advantage, it has to "accumulate, combine, and exploit resources" (Sirmon et al., 2007: 273) to create resources' and capabilities' combinations that are VRIN.

They define resource management as the "comprehensive process of structuring the firm's resource portfolio, bundling the resources to build capabilities, and leveraging those capabilities with the purpose of creating and maintaining value for customers and owners. Structuring the resource portfolio involves using processes (i.e. acquiring, accumulating, and divesting) to obtain the resources that the firm will use for bundling and leveraging purposes. Bundling refers to the processes (i.e. stabilizing, enriching, and pioneering) used to integrate resources to form capabilities. Leveraging involves the set of processes (i.e. mobilizing, coordinating, and deploying) used to exploit capabilities to take advantage of specific markets' opportunities" (Sirmon et al., 2007: 273).

The strategic management of resources is posited by Ireland et al. (2003) as one of the important four dimensions of the SE construct. The other dimensions are 'entrepreneurial mindset', 'entrepreneurial culture and entrepreneurial leadership', and 'applying creativity to develop innovations'. Although a case can be made for integrating SDNM into each of the above dimensions, in this study the main focus will be on integrating SDNM and the strategic management of resources and innovation processes. Because external networks have become a major domain for exploitation and

exploration activities, SDNM capability's active role in the innovation processes and the strategic management of resources' stages is elaborated on to further show how SDNM can facilitate SE. This is in line with objective of this dissertation of integrating SDNM and strategic management. Specifically, this integration is carried out using the RBV as a theoretical underpinning. Indeed, SDNM, as a business strategy and capability that deals with resources and capabilities diffused throughout the firm and the network to implement strategies, is closely related to the RBV theory.

As mentioned above, the external network is one of the domains for value and wealth creation that is common to both entrepreneurship and strategic management (Ireland et al., 2001). Moreover, the resources and capabilities that provide a VRIN combination capable of creating competitive advantage are dispersed throughout the network. Indeed, no one firm is endowed with all the know-how and tangible resources needed to create an entrepreneurial competitive advantage through innovation in uncertain and dynamic environments (Powell et al., 1996), especially for complex products (Gerwin, 2004). Therefore, the ability to identify, manage and exploit resources that reside inside the firm and that are dispersed throughout the network becomes a critical capability (Henderson & Cockburn, 1994; Ireland et al., 2003; Mahoney, 1995; Mahoney & Pandian, 1992; Teece et al., 1997; Zott, 2003). This capability to manage resources and capabilities not only affects the performance and the realization of SE but also the boundaries of the firm pursuing SE.

According to Ireland and his colleagues (2003), financial, human and social capitals are the critical resources and capabilities that need to be managed strategically in

a manner that supports both entrepreneurial and strategic actions (Sirmon et al., 2008). In fact, Sirmon et al. (2008), study dyadic competitive rivalry and examine relative levels of rivals' resource management and resources and find that when resource stocks are similar, resource management is more important for competitive advantage. Thus, these resources need to be effectively structured in a resource portfolio first. Second, they need to be bundled into unique combinations and configurations to create capabilities that are capable, when deployed (leveraged), to exploit opportunities and create competitive advantage (Eisenhardt & Martin, 2000; Sirmon & Hitt, 2003; Sirmon et al., 2007; Teece et al., 1997).

Resource portfolio is "the collection of all the tangible (i.e., financial) and intangible (i.e., human capital and social capital) resources the firm owns or controls" (Ireland et al., 2003: 977). Under hypercompetition, the ability to sense, identify, learn, and access resources and capabilities existing throughout the network becomes critical to creating the optimal resource portfolio (Pavlou, 2004; Pavlou & Sawy, 2006; Teece, 2007; Teece, Pierce, & Boerner, 2002; Teece et al., 1997). The three stages of managing resources strategically are then:

6.4.1 Structuring

According to Sirmon et al. (2007: 277) 'structuring' the resource portfolio to maximize the value is done through 'acquiring' resources from the factor market, especially resources that are complementary to internal resources, 'accumulating' resources by developing resources internally and 'divesting' resources that could create rigidities and inflexibilities (Sirmon et al., 2007).

6.4.2 Bundling

'Bundling' resources is combining various resources from the resource portfolio to create and modify capabilities, and it occurs through 'stabilizing' (small improvements on existing capabilities), 'enriching' (elaborating a current capability), and 'pioneering' (creation of a new capability) (Sirmon et al., 2007).

6.4.3 Leveraging

'Leveraging' is the application of the bundled resources (i.e., capabilities) in order to exploit market opportunities and create value. And it takes place through 'mobilizing', which is the identification of the right capabilities needed to seize opportunities, 'coordinating', which is the integration of the identified capabilities into efficient capability configurations, and 'deploying', which is the actual physical use of the capability configurations to implement the leveraging strategy (Sirmon et al., 2007).

The above stages form the resource management capability and they involve and depend on the firm's tacit knowledge that resides in the human capital. Sharing and accumulating tacit knowledge heavily depend on the relational and social capital within the network. The three stages of managing resources strategically play a critical role in both identifying entrepreneurial opportunities and developing competitive advantages to exploit those opportunities along with the other dimensions of SE. This simultaneous opportunity and advantage-seeking behavior affects the organizational form (i.e.,

boundary) and encourages the firm to continuously evaluate its structure and adapt as the conditions change.

Therefore, for firms pursuing SE, it is paramount to manage their resources strategically in order to identify and exploit entrepreneurial opportunities. And because all the required knowledge-based resources and capabilities are rarely opulent within one firm, companies have to access them from external networks. The access can be in different forms: arm's-length relationship (market), strategic alliances and partnerships (hybrid), mergers and acquisitions (vertical integration). Managing the network of suppliers to create value for its customers has long been the emphasis of the SCM field. Although often ignored by the strategy field, SDNM capability can positively contribute to the dimension of strategically managing resources and consequently the SE construct. In the reminder of section 6.5 an effort will be made to relate and integrate SDNM practices with the strategic management of resources dimension of the SE construct.

6.5 Strategic Management of Resources and SDNM

In an effort to show the importance of SCM (SDNM capability) to SE, the role of SDNM in enabling the strategic management of resources and innovation and consequently SE will be elaborated on in this section. There is much parallel in the fields of SCM and strategy when it comes to SE. This is especially true in the case of developing new products, a research area that has been extensively addressed by the SCM field and is also of great importance to the SE construct. Extant literature in the strategy and entrepreneurship fields point to the alliances and networks as entrepreneurship accelerators and sources of innovative ideas (Doz & Williamson, 2002;

Powell et al., 1996). Powel et al. (1996), for instance, considers interorganizational cooperation the locus of innovation because sources of expertise are widely dispersed beyond an individual firm and alliances and networks can provide access to complementary resources and capabilities, new markets, and information (Hitt et al., 2001c).

Similarly, the SCM field has pointed to the suppliers and customers' important role in developing new products that meet and exceed customer demands in the most efficient and effective way (Dyer et al., 1998; Handfield et al., 1999; Petersen et al., 2003, 2005). Moreover, the effective management of the strategic alliances making up the network creates embeddedness, which further facilitates the transfer, absorption of tacit knowledge residing within the firms in the network (Grant & Baden-Fuller, 2004). That in turn can enable collaborative entrepreneurship which can provide a stream of continuous innovation (Ketchen et al., 2007), which is required to effectively compete (Hamel, 2000; Hitt et al., 1998).

Therefore, a capability must exist that enables the firms searching for specialized capabilities, which often reside in other firms, to identify, access/integrate and leverage these capabilities in pursuit of entrepreneurial opportunities in a strategic manner. This works proposes SDNM is such a capability, which seeks to provide a holistic view of the entire demand network (chain), which connects the end customer requirements with upstream suppliers capabilities, and thus enables the network to match supply with demand efficiently and effectively (Lee, 2000; Lee et al., 2000). SCM (and SDNM) by definition seeks to systemically and strategically coordinate business functions and

tactics inside the firm and across the supply chain (demand network) in order to create a seamless supply activity (Frohlich & Westbrook, 2001, 2002; Li et al., 2006a). However, the objective of the SDNM capability should be congruent with the business strategy (Fine, 1998; Fisher, 1997; Miles & Snow, 1994) otherwise the operations will not be able to meet competitive strategy requirements. Where efficiency is important for example, lean supply chains might be most suitable, but when speed and customization is more relevant agile supply chains are more pertinent (Vonderembse et al., 2006).

Throughout this work, the RBV is used as a theoretical underpinning and SDNM is proposed as a resource-accessing, resource-configuring, resource-combining and resource-deploying business competency (a strategic, tactical and an operational capability) that falls under the RBV paradigm (Teece et al., 1997). These actions together constitute the core competency necessary for entrepreneurship (Ireland et al., 2001). In the following subsections, I will relate SDNO, SDNM practices and the SDNM capability to the SE construct' managing resources strategically dimension. The emphasis will be on innovation and managing resources to enable innovation within the external network domain, a domain in which "the integration between entrepreneurship and strategic management occurs naturally" (Hitt et al., 2001: 481). It is indeed worthwhile for the strategy field to utilize the SDNM capability and the strategic, tactical and operational activities and functions that fall under the SDNM (SCM) construct to implement competitive advantage strategies. Conversely, The SCM field should adopt the different competitive advantage theories from the strategy field in order to enable more effective design and management of the demand network.

6.5.1 SDNM practices and the structuring stage

The firm's resource portfolio determines the maximum value the firm can create (Makadok, 2003; Sirmon et al., 2007) and it refers to all the resources the firms owns or controls according to Ireland et al. (2003). However, within the SDNM context and because competition has moved from firm versus firm to network versus network (Christopher, 2005), I posit that if the firm seeks to create value then the resource portfolio should not only be comprised of the tangible and intangible resources the firm owns but should also be based on the resources owned and controlled by its strategic partners (McEvily & Zaheer, 1999). Indeed, the unit of analysis should not be only the firm under the SE construct, instead, the analysis should also consider the alliances and the network (Kor, Mahoney, & Michael, 2007). The external network's resources which the focal firm can access, integrate, combine with its complementary resources and deploy to seize market opportunities are critical for pursuing entrepreneurship and competitive advantage in hypercompetitive environments (Hitt & Ireland, 2000; Sarkar et al., 2001).

Hence, under this scenario, the tacit knowledge of the various resources and capabilities existing in the firm's network and how they can complement a firm's internal resource and capability portfolio, and other firms' portfolios, becomes very critical for structuring the appropriate resource portfolio (Harrison et al., 2001; Helfat, 1997; Peteraf, 2005; Rothaermel, 2001). To this effect, SCM's field's SDNO as a

philosophy and SDNM as a business competency seek to help the network operate as one firm, having all the coordination benefits of one firm and none of the inflexibilities, investments and bureaucracy costs of the vertical firm. The SDNM capability can lead to higher degrees of integration between the demand network members which can in turn provide a holistic view of the network, knowledge of interdependencies, awareness of operational capabilities and capacities of different partners (Vickery et al., 2003). Active SDNM also promotes continuous collaborative interactions between boundary spanners, whose roles extend beyond the boundaries of their firms to connect the firms processes and products with partners' processes and products. Interactions that can create embeddedness through which stakeholders build social capital, build trust, communicate, share ideas, create relational capital and jointly work to exploit entrepreneurial opportunities (Dyer & Singh, 1998; Uzzi, 1997).

Successful firms understand the dynamic nature of the resource portfolio. The portfolio structure has to be up-to-date to enable the firm's capabilities to fit the competitive environment (Zajac, Kraatz, & Bresser, 2000). The resources portfolio determines the firm's flexibility or inflexibility and its ability to exploit opportunities, especially in the short term (Sirmon & Hitt, 2003; Zajac et al., 2000). Therefore, the resource portfolio should be continuously updated by either acquiring new resources, or by building and developing internal resources, or by divesting obsolete resources, or by a combination of the above (Sirmon et al., 2007). And it is when a portfolio of resources, appropriate for a given environment and time, is available to the firm that the firm can combine certain resources and capabilities into a unique configuration that it can then

leverage to exploit market opportunities in order to create value (Lippman & Rumelt, 2003). Indeed, whether the environment is stable and the competitive advantage is not easily imitable (Ricardian rents) or the conditions change rapidly and the competitive advantage is temporary (Schumpeterian rents), 'superior resources' (resource portfolio structure) is at the root of the firm's ability to attain competitive advantage (Peteraf & Barney, 2003). Hence, a valuable resource portfolio is a necessary but insufficient condition to create a competitive advantage (Sirmon et al., 2008). In fact, it is the management's capability to bundle and leverage the resources in its resource portfolio that differentiates it from its similarly endowed competitors (Sirmon et al., 2008).

However, acquiring, building, and divesting resources from a firm's internal resource portfolio often require getting involved into or withdrawing from an adjacent value stage. Making similar decisions on a network level demands a high level of cooperation and collaboration with network partners which is often not readily available (Lee, 2004; Narayanan & Raman, 2004). And it is here, where the SDNM capability can help the firm effectively and efficiently structure its resource portfolio and the network's resource portfolio to enable strategic entrepreneurship. Acquiring resources from the factor market seldom provides the firm with a VRIN resource because competitors, realizing the true value creation potential of the resource, drive up the price beyond the breakeven point (Barney, 1986). Nonetheless, excluding the firm's fortuitousness, if the firm has tacit knowledge on how to uniquely complement the acquired resource(s) with its portfolio of resources, or if it has a resource(s), that is not available to competitors, that when combined with the new resource(s) creates a VRIN resource configuration,

then it can successfully exploit entrepreneurial opportunities that exist in the strategic factor market (Barney, 1986; Makadok & Barney, 2001; Sarkar et al., 2001).

As mentioned previously, rarely do factor markets provide resources that can lead to competitive advantage. Consequently, firms turn to internal development of resources and capabilities ('accumulating'). These resources and capabilities are often built in a path-dependent manner not easily discerned by competitors (causal ambiguity) (Barney, 1995; Miller, Eisenstat, & Foote, 2002). The ability to develop a resource also greatly depends on the firm's knowledge base and its knowledge absorptive capacity (Cohen & Levinthal, 1990; Grant, 1996b, 1996a; Grant & Baden-Fuller, 2004). All of which create causal ambiguity and thus make imitation by competitors less likely and instill on the firm a more durable competitive advantage. Also, when the firm is unable to internally learn the knowledge necessary to develop a specific capability in a timely manner, which is often the case in hypercompetitive environments, it depends on the capabilities of its partners in the external network to learn new skills (Kogut, 2000; Kogut & Zander, 1992; Lane & Lubatkin, 1998).

Divesting, unlike the previous two structuring subprocesses, refers to efficient and effective withdrawal from certain processes and stages, divestiture of nonstrategic assets, and the reversal of ineffective strategic decisions (Ireland et al., 2003; Shimizu & Hitt, 2004; Sirmon et al., 2007). Because contingencies significantly affect the value of a resource portfolio, over commitment to outdated legacy capabilities and holding on to them when conditions change only hinder the firm's ability to adapt to and compete in the new environment (Leonard-Barton, 1992). The divesting process has to be carried

out diligently so that no future competitive advantage knowledge base is lost and no existing core competency is compromised (Sirmon et al., 2007). Hence, through the above ongoing three subprocesses the firm can structure and maintain the appropriate resource portfolio, which provides the basis for the consequent bundling and leveraging stages.

Under the SDNO and SDNM framework, leading firms are able to incorporate supply chain partners' ideas and expertise to derive network innovation (Doz & Williamson, 2002). The SDNM practices: SRM, CRM, ISCM, and information systems and their subprocesses have clear implications for the structuring stage subprocesses. It is the people working at the boundaries with customers and suppliers that are best capable of identifying partner capabilities that can benefit the firm (Parker & Anderson, 2002). The knowledge provided by units interacting with customers and suppliers, when added to the knowledge of internal supply chain management can be a sources of innovative insights, especially in the idea creation stage of the entrepreneurial process (Doz & Williamson, 2002).

SDNM practices enable a tactical and operational evaluation of the network members' resources and capabilities and their potential for compatibility with the firm's business processes. Moreover, the SRM process proactively seeks to manage the supplier relationships for improved efficiency, speed, quality, flexibility, effectiveness and innovation. SRM and its sub-processes: strategic supplier partnership, supplier base reduction, product design collaboration, sourcing, procurement and supply collaboration, etc., can all have a positive effect on the firm's ability to structure the most appropriate

firm and network resource portfolio. Through active SRM, the firm can constantly scan the suppliers' processes, products, and capabilities in search of the best supplier with which to establish a strategic partnership.

Executives who manage the supplier relationship interact with suppliers repeatedly and better understand from their counterparts (executives responsible for CRM at supplier firms) the capabilities of the suppliers, their limitations, the new developments the suppliers are working on, and thus are better able to evaluate and manage the suppliers. Their decision will be based on operational, relational and strategic considerations (Insinga & Werle, 2000). Therefore, SRM's ongoing focus on scanning, evaluating, and choosing suppliers to establish strategic partnership will enable it to play a positive role in better identifying, accessing and even acquiring desired resources to add to the firm and network resource portfolio. The strategic alliance proactiveness, has been shown to lead to entrepreneurship and better market-based performance (Sarkar et al., 2001), and SDNM is posited as a manifestation of proactiveness and as a mechanism for managing strategic alliances. Alliance proactiveness is "the extent to which an organization engages in identifying and responding to partnering opportunities" (Sarkar et al., 2001: 701).

Also, SRM's emphasis on maintaining an optimal supplier-base size leads to a smaller number of suppliers who can enjoy greater economies of scale and longer term partnerships. This will encourage the supplier to explore innovative opportunities and take risks developing entrepreneurial products and processes in hopes of long term business with the customer who depends on it heavily. The small number of strategic

suppliers also reduces the administrative complexities and allows for more face-to-face meetings between partners, information system integration, joint problem solving, and thus create external embeddedness (Choi & Krause, 2006). This collaborative relationship can facilitate the sharing and transfer of tacit knowledge, identification of market opportunities and more accurate evaluation and speedy exploiting of the opportunities.

SRM's active pursuit of product design collaboration and concurrent product development with suppliers also leads to better understanding of suppliers' capabilities and capacities. New product development teams made up of members from customer and supplier firms can lead to knowledge spillovers which the partners can use in other settings to improve the overall network performance. This collaboration enriches the firm's knowledge base and its ability to develop resources internally and hence leads to superior products and shorter development and launch times for innovative products. These actions allow the firm to effectively seize entrepreneurial opportunities (Croom, 2001; Deeds et al., 2000; Gerwin, 2004; Handfield et al., 1999; Iansiti & Clark, 1994; Koufteros & Marcoulides, 2006; Koufteros et al., 2007; Koufteros et al., 2002; Petersen et al., 2003, 2005; Ragatz et al., 2002; Ragatz et al., 1997; Takeishi, 2001).

Thus, SRM and its subprocesses enable a holistic and comprehensive appreciation of supplier capabilities and how they fit with the firm and the network's resource portfolio enable the firm to make a more informed resource portfolio decision (Das, Narasimhan, & Talluri, 2006; Frohlich & Westbrook, 2001; Iansiti & Clark, 1994; Koufteros et al., 2007; Koufteros et al., 2002; Lee, 2000; Morgan & Monczka, 1996;

Petersen et al., 2003, 2005; Ragatz et al., 2002). SRM-function members are the best suited to address compatibility and integration issues regarding the acquiring of and or accessing supplier resources. Their constant contact with suppliers and their connection with the ISCM and CRM functions under the SDNM function give them the full demand network view. This enables them to provide more informed advice on upstream capabilities countering the information asymmetries created in uncertain environments due to the top managers' inclination to centralize decision making (Keats & Hitt, 1988; Sirmon et al., 2007). Therefore, the SRM capability, through active evaluation and reduction of the supplier base and continuous proactive interaction with suppliers, can lead to a more efficient and effective resource structuring stage.

On the other end of the focal firm, CRM seeks to manage the customer relationship in order to meet and exceed customer expectations (Chopra & Meindl, 2004). All firms desire long-term strategic relationships with customers to enable the firm to invest in scale and grow. Therefore, CRM is used to actively manage the customer relationship and work with the customer on product and service development, delivery, capacity planning, and other processes pertaining to ISCM or the SRM. CRM facilitates the building of relational capital and creates embeddedness between the partners, enables faster responses to customer wants and needs, and increases the networks' adaptability and flexibility. CRM also provides the firm with insights on which resources to add to its resource portfolio structure so that it can better serve its customers. By engaging with the customers, firms add to their knowledge on how their products and services complement the customers' processes and services. This

knowledge, if used properly can guide not only the ISCM and SRM capabilities but also the entire SDNM capability. And, as this knowledge disseminates throughout the demand network, it will result in a more efficient, effective, and responsive demand network (Powell et al., 1996).

Therefore, CRM not only can guide the process of identifying the right resources and capabilities to acquire and develop but it also can help these processes by working jointly with the customer to develop the desired capabilities and integrate them with the customer's capabilities. The CRM capability endeavors to understand the needs of the end customers and works with the immediate customer to meet those needs in an efficient, innovative and differentiated way. CRM's continuous engagement with the customer enables the firm to better plan and executes its ISCM and SRM, hence leading to a more effective resource portfolio structuring.

ISCM represents the firm's ability to effectively manage its internal operations in a manner that identifies and exploits all synergy potential between the different internal capabilities and utilizes SRM and CRM to fulfill the customers' demands. It is the capability that understands the internal operational core competencies and incorporates the knowledge gained from SRM and CRM to develop internal capabilities in order to complement suppliers' and customers' capabilities and vice versa. Hence, it is best suited to evaluate and determine the capabilities to be acquired, developed or even divested because it is in charge of the firm's internal processes carried out to fulfill customer demands. As noted earlier in this dissertation, strategic planning, demand planning, supply planning, order fulfillment, manufacturing and service flow

management, lean practices, agile practices, postponement and other internal processes are subprocesses of ISCM.

Strategic planning of processes and operations is directly concerned with the internal resources and capabilities, their planning, their use, and their deployment to meet the demand in an efficient and effective manner. Strategic decisions such as in which facilities to invest, which internal resources to expand and which resources to shed are directly related to structuring the resource portfolio. Supply planning on the other hand, seeks to assure meeting the demand by making use of the information and knowledge acquired from the customers and the suppliers to enable proper strategic planning. ISCM works to coordinate between functions within the firm to eliminate redundancies and smooth the flow of material, information and money among the different units of the organization (Vickery et al., 2003).

In addition, the ISCM capability can also provide advice on which resources to acquire from the strategic factor market, and which to develop internally based on the firm's current knowledge-base and resource portfolio. A firm's ability to manage the internal supply chain and knowledge of the system interdependencies enable it to integrate the newly acquired resources with the firm's resource portfolio. This ability comes from the direct management of the procurement, production and distribution operations carried out to deliver products or services. Thus, the ISCM function is directly involved in the evaluation and integration of a new resource into the resource portfolio.

Last but not least, SDNM's call for information sharing between demand network partners and the call for investment in information sharing systems also affects the firm's ability to structure the most appropriate resource portfolio. It is only after sharing information that any form of network coordination policies can be implemented (Sahin & Robinson, 2002; Sahin & Robinson, 2005). Information sharing is the basis on which a better supplier-customer relationship can be built (Karaesmen et al., 2002; Kim et al., 2006; Lee et al., 2000; Lummus & Vokurka, 1999a; Mason-Jones & Towill, 1999; Yu et al., 2001). By knowing the POS sales data, end-customer demand, inventories, and production capacities for example, firms can better plan the supply and increase efficiencies throughout the network (Lee, Padmanabhan, & Whang, 1997; Lee et al., 2000).

Moreover, sharing information on innovations under development within the firm and with key suppliers and customer throughout the network positively affects network members' resource portfolio structure decisions (Gerwin, 2004; Handfield et al., 1999; Pavlou, 2004; Petersen et al., 2003; Ragatz et al., 2002; Ragatz et al., 1997; Song & Di Benedetto, 2008). For example, a firm will be able to adapt more effectively if it knows that a supplier is working on a new technology that may affect its processes. Also, when SRM, CRM, and ISCM utilize information regarding processes that are interdependently connected throughout the network, the partners are better able to jointly work on finding solutions. Therefore, sharing information and knowledge on capabilities that affect other partners' capabilities will lead to better resource portfolio structuring, both inside the firm and throughout the network.

From the above discussion, we can conclude that the SDNM practices, supported by the SDNO, can enable the firm to be more effective in structuring its resource portfolio. SDNM practices provide a holistic view of the network, give the firms a better understanding of the strategic, tactical and operational interdependencies that exist within the network, and enable the network members to work jointly to implement strategies designed to pursue competitive advantage. This brings us to the first proposition in this chapter, which is:

> *Proposition 1: SDNO and SDNM practices enable more effective resource portfolio structuring that can lead to a more effective strategic management of resources.*

6.5.2 SDNM practices and the bundling stage

Bundling the resources is the next step after structuring the resource portfolio, whereby the firm configures resource combinations based on the resource portfolio to create and modify capabilities that will enable the firm to take strategic and entrepreneurial actions in pursuit of competitive advantage (Ireland et al., 2003). After the firm has established a satisfactory resource portfolio, it is important for the firm to be able to identify valuable combinations of the resources (internal or accessed through the network) and to bundle them in a manner that creates the desired capabilities. Bundling can be thought of, in its simplest form, as bringing different individuals together in a team to solve a problem or, in a higher form, as bringing two suppliers together to jointly develop a new product that no one supplier has the capability of developing alone.

How the bundling of resources actually occurs varies depending on the environmental uncertainties because firms will need to create new capabilities in the face of high environmental uncertainties that render old capabilities inadequate (Sirmon et al., 2007). On the other hand, less costly bundling process of incremental improvement of capabilities is more suitable in stable environments (Sirmon et al., 2007). Thus, the bundling process varies based on relatedness of the existing capabilities to environmental contingencies and competitive advantage. Whether the resources and capabilities bundling is achieved through stabilizing, enriching or pioneering, the SDNM capability can be associated with each process. This is true if the bundling process is carried on using resources and capabilities residing within the firm, or throughout the network.

Indeed, it is through active SRM that a firm can identify and bundle strategic suppliers' resources with the firm's resources to create a desired capability. And it is through the CRM that the firm develops insights on customer resources and how the other suppliers serve the customer, which enables it to more effectively bundle its resources and provide maximum value for the customer. The customer then can bundle the resources combination provided by the suppliers with its resources to create capabilities that can be leveraged to exploit opportunities identified by its CRM capability. Moreover, CRM and SRM enable the firms to jointly indentify needs, and provide the holistic view of the network resources, and the mechanism through which the partner firms create relational capital and structural and social embeddedness, which in turn enable the bundling of the firm's resources with the customer's and supplier's

resources in a more effective manner (Choi & Kim, 2008; Dyer & Singh, 1998; Uzzi, 1997).

Therefore, SDNM can be the actual mechanism through which the bundling process is implemented and realized because it can integrate the operational interdependencies throughout the network. Also, because SDNM practices (SRM, CRM, ISCM, and information sharing) strive to reduce the effect of external uncertainties on the chain by creating and accentuating synergistic relationships within and among the network partners (CSCMP, 2009), they are best capable of identifying which resources to stabilize, which to enrich, and which to pioneer. The SRM manages the relationships and provides knowledge of upstream entities, while the CRM provides intermediate and end-customer related knowledge. ISCM capability integrates external knowledge and capabilities with internal know-how and capabilities to carry out internal operations more effectively.

This brings us to our second proposition which is to point to the SCM field's close association with the bundling of resources process. And because resources often lay outside the firm, the field of SCM and the SDNM capability stand to provide great insights on how the bundling process actually takes place. Hence the following proposition:

> *Proposition 2: SDNO and SDNM practices enable a more effective resource bundling stage that will lead to more effective strategic management of resources.*

6.5.3 SDNM practices and the leveraging stage

Next, is the leveraging of capabilities stage, the last of the three stages in the strategic management of resources proposed by Sirmon et al. (2007) and others. This stage deals with how the capabilities (created by bundling resources from the structured resource portfolio) will be leveraged to pursue competitive advantage, in specific, through strategic entrepreneurship. This stage is comprised of three complementary (sequential in any order or simultaneous) subprocesses: mobilizing, coordinating and deploying. Mobilizing is the act of "identifying the capabilities needed to support capability configurations necessary to exploit opportunities…" (Sirmon et al., 2007: 277). Coordinating is the process of "integrating identified capabilities into effective yet efficient capability configurations" (Sirmon et al., 2007: 277). Deploying is "the process of physically using capability configurations to support a chosen leveraging strategy" (Sirmon et al., 2007: 277). The leveraging stage is the most relevant to the SDNM capability as it deals with the actual strategic and entrepreneurial actions taken to produce and deliver products and/or services that exploit market opportunities (Sirmon & Hitt, 2003).

The CRM capability under SDNM can facilitate the leveraging process by identifying the customer's capabilities, processes and needs so that the leveraging process matches the customer's tangible and tacit needs (Slater & Narver, 1999). CRM, through active engagement with the customers, provides the insight into the customer's new projects and the intermediate customer's perception of emerging market opportunities and the capabilities it desires from its suppliers. In fact, CRM can help

identify customer needs even if the customer is not fully capable of identifying and articulating that need. Thus, CRM can be a source of learning to enable more effective mobilizing. Coordinating and deploying resources also involve active interactions with customers which the CRM dimension of the SDNM capability focuses on.

The SRM capability on the other hand can provide knowledge of supplier capabilities and its ability to meet the firm's leveraging strategies. Often, the firm depends on strategic suppliers for resources and capabilities because the firm's performance is embedded in its suppliers' performance and even the suppliers' suppliers' performance, etc (Choi & Kim, 2008; Choi & Krause, 2006; Chopra & Meindl, 2004; Petersen et al., 2008). Therefore, when the suppliers' capabilities constitute a part of the capability configuration to be leveraged by the firm, active SRM will be an invaluable mechanism for integrating and managing the suppliers' capabilities.

Also, whether the leveraging strategy is a resource advantage strategy, market opportunity exploitation strategy, or creating entrepreneurial opportunities strategies, internal business processes and functions will have to support it. Different interdependencies and processes need to be synchronized in order to operate in a seamless fashion and support the desired leveraging strategy. ISCM covers all processes invoked to plan for and meet customers' demands inside the firm and thus it will affect every leveraging subprocess and every leveraging strategy. As noted previously, ISCM's objective is to integrate the internal resources and capabilities, coordinate and align the internal functions to not only reduce waste but also to make the firm more

adaptive (Christopher, 2000; Christopher & Towill, 2001; Christopher & Towill, 2000; Lee, 2000; Lee, 2004).

The resource advantage strategy seeks to leverage capability configurations to create a distinctive core competency. SDNM, through awareness of network competencies and active management of strategic partnerships, can help create a fit between the firm's core competencies and what the customers want. The CRM function can play two roles, on one hand it provides knowledge of the market and the customer; on the other hand, the CRM function works with the customer's SRM function to best utilize the capability configurations developed and offered by the supplying firm.

Moreover, the exploiting market opportunities strategy requires a thorough analysis of the market and the firm's internal and supplier capabilities. All of which fall under the domain of SDNM capability and its practices that explore market needs through CRM, understand suppliers' capabilities through SRM, and align and coordinate the internal operations through ISCM. In addition, an entrepreneurial opportunities strategy requires "developing capability configuration to produce new goods and/or services that require new markets" (Sirmon et al., 2007: 284). New products and markets need to meet and exceed customer expectations, to be delivered on time, to the right place at the right price in order to create value for the customer and the firm. Making sure the right product is delivered to the right place, in the right quantity, at the right time has always been the mantra of the Operations and SCM fields.

SDNM practices also enable the coordination subprocess of the leveraging stage. SDNM in fact endeavors to "integrate mobilized capabilities in an effective yet efficient

manner so as to create capability configurations" (Sirmon et al., 2007: 285). Both tacit and explicit knowledge get shared and transferred as network members actively manage their strategic alliances (Dyer et al., 2001; Dyer & Singh, 1998; Ireland et al., 2002; Kale et al., 2002). Information sharing and continuous communication within the firm and throughout the network in turn lead to more effective coordination (Handfield & Bechtel, 2002; Petersen et al., 2008; Petersen et al., 2005). As previously discussed in chapter five, SDNM practices also support the creation of social and relational capital, which encourages the development of trust between the different parties and hence lead to more efficient and effective integration and coordination (McGrath & Sparks, 2005). And the SDNM process involves much tacit knowledge, mainly embedded in the human capital that continuously interacts to make the network more efficient and effective. This tacit element leads to superior capability coordination capabilities that are hard to decipher and copy (by competitors) (Sanchez, 1995; Sirmon et al., 2007).

And, such is the case with the deploying subprocess, where the capability configuration is physically deployed to enable the desired leveraging strategy. The deployment has to be coordinated with suppliers, with customers and with all relevant internal units in order to synchronize their operations as they pursue the physical deployment. Therefore, I propose that SDNM practices are critical to an effective deployment capability. Sirmon et al. (2007: 286) propose that "managers who are able to build and use relational capital to integrate multiple capabilities into a configuration and to use organizational routines and their tacit knowledge to deploy these

configurations to enact the leveraging strategy are most likely to create value for customers."

Indeed, SDNM's main objective is to do just that based on the environmental conditions, and the customers' and the suppliers' inputs. CRM for example, integrates with the customer and manages the deployment of the firm's capabilities to meet the needs of the customer. SRM integrates the suppliers' capabilities to support the deployment of the desired capability configuration. Finally, the ISCM capability integrates and coordinates all of the internal capabilities and physically deploys the configuration based on the internal and supplier capabilities. Hence I present the following proposition:

> *Proposition 3: SDNO and SDNM practices enable a more effective capability leveraging stage, which enables more effective strategic management of resources.*

According to Ireland et al. (2003), managing resources strategically lead to innovation, which then enables the firm to exploit entrepreneurial opportunities. Therefore, in the next section an effort will be made to briefly describe innovation and the role SDNM capability can play to facilitate innovation based on internal and external networks.

6.6 Entrepreneurship, Innovation and SDNM

Creativity and innovation can create new products, new services, new markets, and new industries (Hitt et al., 2002b) and hence enable the firm to continually renew its competitive abilities in order to survive and prevail in the new competitive landscape

(Hamel, 2000). Moreover, innovation also means brining the invention to the market (Afuah, 1998) and is heavily knowledge-based (Ireland et al., 2001). New knowledge has to be sought, developed, integrated and combined with a firm's knowledge base in an effective manner to enable both exploration and exploitation. Exploration creates new combinations of production factors (innovation), and exploitation effectively implements innovative strategies using idiosyncratic resources and capabilities in order to appropriate maximum value from them.

Innovation is an important source of growth and value creation (Roberts, 2001) and hence it is another active domain common for both the strategic management and entrepreneurship fields (Ireland et al., 2001). Entrepreneurship supports innovation by identifying market opportunities that the firm can then explore innovative means for exploiting the opportunity (Drucker, 1985). Indeed, how fast a product is developed and brought to market is becoming increasingly important in the faced-paced global competition (Subramaniam & Venkatraman, 1999). Therefore, because innovation means realizing the invention of a new product, process, or even organizational form, it is a core part of entrepreneurship (Hitt et al., 2001c), which is often regarded as the launch of a new business or the rebirth of an organization based on an invention. Thus, innovation and entrepreneurship terms are used interchangeably in the rest of this chapter. Moreover, successful implementations of entrepreneurial and strategic actions/processes require the involvement of people and the knowledge that resides within the human capital throughout the organization and beyond.

Any innovative idea that leads to a new product, new process, new venture, and/or new market goes through different stages from idea generation to idea implementation (Cooper, 2002). According to Doz and Williamson (2002), the entrepreneurial process is composed of four stages: idea creation, experiments, venture development and business growth. The ability to access opportunities, i.e. recognize them, and mobilize resources to exploit these opportunities increasingly invoke and need network members' participation (Stuart & Sorenson, 2007). Not only does innovation require network partners' collaboration in this new competitive landscape, but innovation in itself carries risk and has a high failure rate (Teece, 1992). Due to bounded rationality and absorptive capacity limits, a firm may lack sufficient knowledge to discern the environment for entrepreneurial opportunities and also lack the ability absorb new knowledge needed to exploit these opportunities (Cohen & Levinthal, 1990). These issues could explain why innovative firms actively pursue forming alliances (Eisenhardt & Schoonhoven, 1996).

Indeed, launching an entrepreneurial new venture goes through a set of processes which start with the idea generation stage, and followed by the assessment and the development of the idea stage as a second process. Third, the resources and capabilities needed for the idea(s) need to be assembled and in the fourth stage the idea is implemented (Cooper, 2002; Doz & Williamson, 2002). According to relational and social capital perspectives, interactions with network members (internal and external) enable boundary spanners to sense and learn of unmet market opportunities, and/or new technologies developing upstream (Cooper, 2002; Dyer et al., 1998). Those in charge of

coordinating internal units' activities in order to meet demand are well positioned to evaluate the fit between the capabilities of the different departments to exploit a market opportunity (Floyd & Wooldridge, 1999). Similarly those managing the interfirm relationships are more likely to identify synergy opportunities that can generate innovative ideas.

What is more, the innovative idea has to be evaluated and investigated and feedback from both internal functions and external partners on the novelty of the idea and its success potential has to be shared and analyzed. Also, because of the new technology and uncertain nature of innovation, firms often lack the resources necessary for launching a new entrepreneurial venture or introducing a new innovative product. Therefore, firms often have to assemble resources both internally and from external sources and combine them into unique capabilities that support innovation. Last, the strategies outlined to exploit entrepreneurial opportunities need to be implemented in order for the firm to create wealth. And it is in this stage that the innovative firms form alliances with partners who own complementary resources and capabilities.

In reality, networks have become sources of complementary resources and capabilities, sources of legitimacy, sources of market entry and most importantly sources of knowledge-based resources (Alvarez & Barney, 2000; Alvarez & Barney, 2001; Grant & Baden-Fuller, 2004; Kogut, 2000), specially when time is critical for competition (Gulati, 1998). Ergo, the network has a positive effect on firm innovation (Shan, Walker, & Kogut, 1994). Thus, firms pursuing innovation and strategic

entrepreneurship should integrate the SDNM capability and SDNM practices in order to effectively implement strategic and entrepreneurial strategies.

"Firms become much stronger competitors by linking with specialist providers in an integrated supply chain" (Miles, Snow, 2007: 460) because the specialist suppliers have the scale and the know-how to be both more efficient and to provide higher quality and differentiated products. Thus, the network is increasingly becoming a major source of entrepreneurship for established and start up firms alike. Established firm's who have with time and due to size emphasized efficiency for their mature products over autonomous and uncertain innovation seeking activities risk loosing their ability to launch radical innovations with time and thus often seek alliances with smaller firms for novel ideas (Alvarez & Barney, 2001; Nicholls-Nixon & Woo, 2003; Pavitt, 1991). On the other hand, innovative start-ups lack the tangible (for example, capital and a physical distribution network) and intangible resources (reputation and legitimacy to attract venture capitalist) to commercialize their inventions, and thence partner with large firms (Alvarez & Barney, 2001; Cooper, 2002; Doz & Williamson, 2002; Doz & Hamel, 1998).

According to the RBV of alliances, the tacit know-how (knowledge assets) is the most valuable resource that the firm should seek from interfirm relationships if it likes to pursue sustainable competitive advantage (Teece, 2000). SE and sustainable competitive advantage are closely linked through the knowledge creation concept as the first is posited as an antecedent to the second. New knowledge is often created through repeated and close interaction (Floyd & Wooldridge, 1999; Nonaka, 1994). This is

specially true in the face of fierce global competition and demanding customers where a firm's ability to create competitive advantage enabling knowledge is increasingly becoming dependent on collaborative activities with the network of alliances the firm has (Parkhe, 1991; Reid, Bussiere, & Greenaway, 2001).

According to Powell et al. (1996), it is "in the interstices between firms, universities, research labs, suppliers, and customers" (Powell et al., 1996: 118) that the sources of innovation are commonly found. Verily, the ability to integrate knowledge within the firm is at the heart of the firm's competitive capability (Grant, 1996b, 1996a). Still, combining and generating valuable knowledge requires boundary spanning relationships with external entities (Reid et al., 2001). Hence, the ability to manage knowledge sharing through the interstices between the firms and its suppliers and customers becomes critical to innovation and consequently entrepreneurship. In the next subsection, SDNM practices and SDNM capability is integrated with the stages of brining about innovation to further show how SDNM capability can support SE. However, I encourage the reader to refer to the previous chapter for more in depth discussion on how SDNM practices can enable effective knowledge sharing between strategic alliance partners and thus support innovation and strategic entrepreneurship.

6.6.1 SDNM practices and innovation stages

Any innovation starts with an imaginative idea that is then investigated and developed. Once the idea's validity is established, resources are assembled and the idea is implemented. And because collaborative innovation, which is the "pursuit of innovation across firm boundaries through the sharing of ideas, knowledge, expertise,

and opportunities" (Ketchen et al., 2007: 371), is increasingly becoming a critical source of innovation (Ketchen et al., 2007; Miles, Miles, & Snow, 2005; Miles, Miles, & Snow, 2006), it is worthwhile to consider the SDNM practices' role in each innovation process stage.

The SDNM capability strives to create relational and social capital among the network members to support a demand network (supply chain) that is agile, adaptable and aligned (Dyer & Singh, 1998; Lee, 2004). It emphasizes long-term repeated interactions with strategic partners which builds and nurtures trust within the strategic alliance (Uzzi, 1997). Through effective SDNM which is in essence a proactive alliance management capability (Sarkar et al., 2001), a firm gains access to resources and capabilities that are necessary for competitiveness (Stuart, 2000). In fact, SDNM's integration of suppliers into new product development projects has been shown to positively affect performance (Handfield et al., 1999; Koufteros, Vonderembse, & Doll, 2001; Koufteros et al., 2007; Koufteros et al., 2002; Lee, 2000; Petersen et al., 2003, 2005; Ragatz et al., 2002; Ragatz et al., 1997).

The SRM process of actively managing the relationships with key suppliers forming the rationalized supply-base can positively support incremental (exploitation) and radical (exploration) innovation. By actively seeking to optimize the supply base's size a firm will be able to efficiently appropriate increased managerial attention to strategic suppliers and create relational capital (Collins & Hitt, 2006). This will in turn enable the firm to better understand the suppliers' capabilities and be aware of promising new technologies or new products under development which consequently provides a

fertile environment for identifying entrepreneurial opportunities (Cooper, 2002). Although closer relationships support incremental innovation by better exploiting existing capabilities, the embedded nature of the demand network also enables the firm to connect with the more distant upstream suppliers through weak ties, which can be more conducive to radical innovations (Burt, 1992; Choi & Kim, 2008; Granovetter, 1985).

The CRM process mirrors the SRM process on the other end of the firm and strives to understand the customers' processes, capabilities, and requirements. Working with the customers to establish long term relationships and understanding the customers' business also helps the firm customize its products and service to match the customers' needs. In addition to the operations collaboration with the customers on issues relating to production, inventory, delivery and quality, the continuous interactions with the SRM function at the customer firm help create social and relational capital which facilitates knowledge communication and combination (Kogut & Zander, 1992; Yli-Renko, Autio, & Sapienza, 2001). Indeed, the customer can provide user know-how that helps the firm identify improvement opportunities (Yli-Renko et al., 2001; Zahra, Ireland, & Hitt, 2000). Moreover, network ties can enrich a firm's market knowledge and hence guide the development of capabilities (McEvily & Zaheer, 1999) because customers, suppliers and other external entities can be the source for many product innovation ideas (Utterback, 1971; Von Hippel, 1988). Thus, integrating with customer and actively managing the relationship through CRM can help identify and generate innovative ideas to meet unmet market needs (Cooper, 2002).

The ISCM process focuses on the internal operations of the enterprise that are involved in planning and fulfilling the customer's orders (Chopra & Meindl, 2004). It integrates the different functions and capabilities inside the firm with inputs from CRM and SRM processes to make sure supply meets demand as smoothly and efficiently. As it looks at the internal processes in a systematic way, it is well positioned to identify opportunities for improvement (Floyd & Wooldridge, 1999). Besides, it is only when a firm understands its internal processes that it is truly and effectively able generate ideas for improvement, whether internally or by complementing suppliers' and customers' capabilities. Thus, the ISCM process is positively related to effectively generating innovative ideas that are based on holistic understanding of the internal chain and how it fits the demand network (Cooper, 2002). Of course, the ISCM, SRM and CRM macro processes are supported by the information sharing practice of SDNM.

The SDNM practices (SRM, CRM, ISCM, and information sharing) also play an important role in the assessment and the development of the idea stage. As a firm may lack the requisite knowledge to evaluate and appraise the idea, it surely stands to benefit from customers' inputs regarding the idea's market potential and from the suppliers' inputs regarding the availability of the technologies and capabilities to operationalize the idea. Network partners' can also reduce the cost and time of the assessment process because their experience can save the firm time and effort as it prepares prototypes and experiments to test the idea that is heavily dependent on collaborative innovation (Ketchen et al., 2007).

Moreover, in this stage the firm will need to evaluate the suppliers to asses which can support the entrepreneurial idea and to do that, an SRM capability that understand suppliers capabilities will be critical. This is also true for ISCM which will handle the mobilization of the internal resources and capabilities to develop the innovation. And the CRM capability will have to work with the customers to explain to them the innovation and how it will help them gain competitive advantage. In this stage the entrepreneur needs to gather information on its internal capabilities and on the network members' competencies to accurately evaluate the feasibility of the innovative idea (Cooper, 2002; McGrath, 1999). This again is something the SDNM capability can do because of its involvement in the operational process spanning the network as it strives to make supply meet the demand as efficiently and as effectively as possible.

Once the idea has been assessed the resources need to be assembled in order to launch the venture or the product. Whether the firm is endowed with the necessary resources to support the entire value chain or has to use external resources to complement the internal resources, the value chain activities need to be integrated and coordinated in order to successfully realize the innovative idea. Due to the uncertainty surrounding innovative product's success, the firm and the network partners take much risk when they invest in the venture. Because of that risk and uncertainty, Cooper (2002) and Doz and Williamson (2002) emphasize the importance of alliances and network relationships the entrepreneur firm is involved in as a mean of gaining legitimacy and encouraging suppliers to make relation-specific investments. Indeed, the customers and the suppliers are not only sources of innovative ideas and opportunities

(Ahuja, 2000b) but are also critical sources of resources and capabilities (Dyer, 2000; Dyer & Nobeoka, 2000; Gulati, 1998; Gulati & Lawrence, 1999; Kogut, 1988).

Therefore, CRM, SRM, ISCM and information sharing practices are also important in the resource assembly stage. The CRM can work with the customer to obtain point of sale (POS) data needed to effectively plan the production, inventory and distribution of the innovative product to insure its availability. On the end, the SRM process assembles the needed combination of resources and capabilities to meet the CRM and ISCM requirements. It also brings together the right suppliers in the product development process to insure timely availability of material and early input from the suppliers regarding the design of the product (Handfield et al., 1999; Petersen et al., 2003, 2005; Ragatz et al., 1997). ISCM processes on the other hand integrate resources from the different internal functional departments and processes needed to develop and launch the entrepreneurial venture (Clark & Fujimoto, 1990; Clark & Fujimoto, 1991).

Furthermore, the implementation stage is where everything comes together and the different resources and capabilities are leveraged to create the innovation. If the innovation is a new product, then the product is actually produced using the internal capabilities, the suppliers' capabilities and delivered to the customer. If it is a new market then the demand network needs to be managed to bring the product to the new market in the right quantity, the right time and for a price that will create value for the customer and the demand network. All of the above involve and require a great deal of coordination between different entities which extend organizational boundaries so that innovation is capable of creating wealth. Moreover, like any other product, innovative

products need to be matched with the right supply chain (demand network) design, structure and capabilities.

As the innovative product moves from an introduction and growth phase, where speed and differentiation are critical, to a maturity and decline phase of its lifecycle, where price is critical, the demand network's emphasis should shifts from agility and flexibility to efficiency and leanness (Vonderembse et al., 2006). Often, innovative ideas fail to create wealth because the entrepreneurial exploration actions are not accompanied by strategic exploitation actions to effectively produce and appropriate value from the innovation (Hitt et al., 2001c, 2002b, 2002a; Ireland et al., 2001). Therefore, scholars have argued for integrating the fields of entrepreneurship and strategic management (Ireland et al., 2001; Ireland et al., 2003; Meyer & Heppard, 2000; Meyer et al., 2002; Miles et al., 2005; Miles et al., 2006; Venkataraman & Sarasvathy, 2005).

Entrepreneurial activities involve risk and their outcomes are usually uncertain (Mowery et al., 1996). What's more, they might be perceived as threats to established core competencies within the firm or within the network. Therefore, a strategic network orientation will be extremely valuable in aligning interests and explaining the long-term and strategic benefits to the entire value chain. SDNM practices and SDNO facilitate the recognition of the strategic implications of the strategic, tactical and operational activities involved in managing the flow of products, information and funds in the network (Mentzer et al., 2001).

Moreover, entrepreneurship requires specialized knowledge and parts and when there are few suppliers available markets do not function very well (Kaufman, Wood, & Theyel, 2000). On the other hand, because know-how is gained through cumulative learning and interaction experience (Dyer & Singh, 1998; Powell et al., 1996), rarely does a single firm have all the knowledge required or has the ability to learn the requisite know-how in a competitively timely manner. Thus, dependence on strategic partners with whom SDNM practices help share know-how through repeated collaborative interactions, becomes the most effective organizational form (Grant & Baden-Fuller, 2004). Consequently, SDNM practices will have a role in the innovation stages, whether the know-how integration and coordination are intrafirm or interfirm. Based on the previous discussion, the following proposition is presented.

Proposition 4: SDNO and SDNM practices can play a positive and essential role throughout the stages of the innovation (entrepreneurship) process.

Based on sections 6.5 and 6.6, an argument can made to connect SDNM and SE. In the next section, this relationship is explored.

6.7 SDNM and SE

Corporate entrepreneurship (CE) is the sum of all the inventions and innovations in developing new products, new technologies, new processes, new organizational structures, and entering new markets that the firm develops in order to seize an entrepreneurial opportunity (Covin & Slevin, 1991; Covin & Slevin, 2002; Hitt et al., 1999; Teng, 2007; Zahra & Covin, 1995). Whether it is new products, new processes or new markets, firms often need to depend on network partners' resources to create

innovations faster than competitors (Teng, 2007). Therefore, it has become important for the firm to have the dynamic capability to understand the strategic alliance partners' abilities to sense and identify opportunities, to discern the network knowledge, to integrate the partners' resources with the firm's and the other network members' resources, and to combine network resources in novel ways to create capabilities that it can leverage to exploit identified entrepreneurial opportunities (Stopford & Baden-Fuller, 1994; Teece et al., 1997).

Indeed, Teng (2007) uses the RBV of the firm to show the facilitating role of alliances for CE. His main argument is the CE creates resource gaps that force the firm to use strategic alliances to access the complementary external resources. Resource gaps result from the fact that the firm's innovations sometimes require resources beyond what the firm is endowed with. These gaps can be filled by developing internally, by acquiring the resources the factor market, by acquisition of entire firm, or through strategic alliances (Teng, 2007). Each strategy has advantages and disadvantages but strategic alliances are preferred when there is a desire for speed, flexibility and to share risks and costs (Teng, 2007). The reader is again referred to the previous chapter for a more elaborate literature review. The need for fast learning and flexibility is extremely important for obtaining and sustaining competitive advantage in the hypercompetitive environment (D'Aveni, 1994; Shimizu & Hitt, 2004), and it often achieved through strategic alliances (Lane & Lubatkin, 1998; Yoshino & Rangan, 1995). However, Teng (2007) also note that using strategic alliances for CE does not necessarily lead to value

creation and competitive advantage. Instead, it is contingent on meeting the VRIN requirements of the RBV.

Product, process, or organizational innovations is the most common manifestation of CE (Covin & Miles, 1999) but innovation carries substantial risk (Teece, 1992) and that's why innovative firms are more active in seeking strategic alliances with partners that fill the resource gaps created by CE (Eisenhardt & Schoonhoven, 1996). The goal of these interfirm relationships is to balance the exploration and exploitation activities of the firm to prevent atrophy (March, 1991) and reduce the risk of the uncertainty involved in the entrepreneurial exploration process. And, because SE combines both 'opportunity-seeking' and 'advantage-seeking' behaviors (Ireland, Hitt, & Webb, 2006), it is increasingly being recognized as a means for creating and sustaining value (Hitt et al., 2001c; Ireland et al., 2003; Ireland et al., 2006).

The role of alliances and networks in supporting entrepreneurship has been extensively researched and so has strategic alliances' role in exploiting complementary resource combinations in the field of strategy. However, this is the first work to my knowledge that proposes the integration of the tactical SDNM capability in specific, and the SCM field in general, with SE. The concept of SCM has become very popular in the era of vertical disintegration when firms realized that their competitive advantages depend not only on their own strategic positions and/or resources and capabilities but also on the capabilities of their suppliers and other network members (Afuah, 2000; Hoetker, 2005). And in the face of the new competitive landscape characterized by the

fierce global competition, short product life cycles, and temporary competitive advantages, SE has been posited to enable and balance the exploration of future opportunities and the exploitation of current competitive advantages (Ireland & Webb, 2007a).

A balance between exploitation and exploration activities is necessary for sustained competitive advantage (Christensen, 1997; Christensen & Raynor, 2003) because without exploration, operational capabilities that constitute the core competencies of the firm become obsolete while without exploitation, innovations fail to create value and turn into competitive advantages. However, SE requires a great deal of awareness and understanding of the interdependencies that exist between the different functions and processes, internally and externally, which is promoted by SDNO and supported by SDNM practices. Thus, the field of SCM and the SDNM practices in particular can play a critical and positive role in both exploration and exploitation activities.

Although the emphasis of SDNM seems to be on exploitation activities, I believe SDNM practices can also facilitate exploration activities. In new product development processes for example, the SCM field has shown the operational benefits of involving customers and suppliers in order to explore customer needs and exploit supplier capabilities. Extant research posit that suppliers of systems and subsystems, complex items, critical items and systems, “black box” suppliers, and strategic alliance suppliers should be integrated in earlier stages of the new product development process because of the criticality of their operational capabilities in meeting cycle time objectives that

greatly affect the success chances of innovative products (Handfield et al., 1999; Petersen et al., 2003, 2005; Ragatz et al., 2002; Ragatz et al., 1997).

Moreover, a firm that adopts active SDNM, like Toyota, is known for not only involving their suppliers but also for working with strategic suppliers to explore opportunities for improvement (in speed, quality, delivery, and cost). On the other hand, the understanding of the customers' processes and exploring for improvement opportunities (radical or incremental) is promoted in the SCM field and is implemented through CRM (Bolton, 1998; Cachon & Terwiesch, 2006; Chopra & Meindl, 2004; Croxton et al., 2002; Frohlich & Westbrook, 2001, 2002; Lee & Whang, 2001; Li et al., 2006a; Li et al., 2005; Lummus & Vokurka, 1999a; Raman, 1998; Williams et al., 2002). The above integration of customers and suppliers lead to superior new product development processes because SDNM's proactive involvement with the customers and strategic suppliers can have positive implications for successful introductions of streams of innovative new products, their success, and consequently the firm's competitive advantage (Eisenhardt & Tabrizi, 1995; Ireland & Webb, 2007a; Verona & Ravasi, 2003). Given that "new products have been indicated as the most natural force behind change and renewal at the corporate level" (Verona and Ravasi, 2003: 577) makes the innovative new production development processes even more imperative for exploration and exploitation activities and consequently SE.

Furthermore, in recent years the field of SCM has recognized the importance of designing the right supply chain concurrently with designing the right products and processes (Fine, 1998, 2000; Fisher, 1997; Vonderembse et al., 2006). If the product is a

standard and mature, then efficient and lean supply chain designs are chosen but when the product is innovative an agile supply chains is developed. Lean supply chains for example build to forecasts and locate the inventory in a centralized location to lower storage costs but incur higher delivery times. Agile supply chains on the other hand only build in advance the known or generic components of the products and defer the final assembly and customization until an order is received (Christopher, 2000; Christopher & Towill, 2001; Vonderembse et al., 2006). The deferral process is often known as postponement where the final product is only assembled as a response to real demand (i.e. order) and often the final assembly is done near the customer to insure faster delivery; albeit at higher cost (Billington & Amaral, 1999; Cvsa & Gilbert, 2002; Edward & Lee, 1997; Feitzinger & Lee, 1997; Hoek, 2001; Pagh & Cooper, 1998; Van Hoek, 1998).

Although largely ignored by the strategy field, the SCM (SDNM), a tactical and operational capability, is of important relevance to strategy implementation in the disintegrated competition era (Evans & Danks, 2000). This is especially true under the RBV of the firm where the effective management of resources have been posited to be a source of competitive differentiation. Moreover, because exploration and exploitation activities span organizational boundaries throughout the supply chain (demand network), SDNM practices can naturally play a role in implementing and supporting both.

In fact, SDNM aims to integrate and coordinate the operations of the different firm making up the demand network that are galvanized to meet the customer demand so that supply seamlessly meets demand. Operations management by definition “refers to

the direction and control of the processes that transform inputs into finished goods and service" (Krajewski, Ritzman, and Malhotra, 2007: 6). It is a functional area that intersects with the other functional areas within the organization as it works to realize the competitive priorities (cost, quality, time, and flexibility) set forth by the corporate strategy (Krajewski, Ritzman, & Malhotra, 2007).

What's more, operations strategy will choose the positioning strategy (process focus, product focus, or intermediate focus) which will subsequently affect the strategic choices (quality, process), design decisions (capacity, location, layout, job design, new technologies), and operating decisions (materials management, aggregate plans, inventory systems, master production schedules, scheduling) (Chase, Jacobs, & Aquilano, 2006; Krajewski et al., 2007). The functional area strategies will then provide feedback to corporate strategy on the status of capabilities currently available, the capabilities needed, and plans for developing and/or acquiring the lacking capabilities (Krajewski et al., 2007).

Hence, the operations management function deals with the psychical production (or rendering) of the innovative product (or service) that is targeted to exploit an entrepreneurial opportunity. In case the entrepreneurial activity's focus is the actual business or manufacturing process, again, it falls under the realm of the operations management function. And when the processes that design, produce, distribute and deliver a product span organizational boundaries, the management of the strategic demand network operations, in other words, the SDNM capability becomes necessary. Otherwise, inefficient and ineffective operations will result that will be unable to meet

competitive priorities. Operations need to be managed beyond the firm and partner capabilities and interests need to be incorporated to support both exploitive (historically the focus of OM and SCM) and explorative (new direction for SCM) activities under SE. The SCM field has largely come about to manage the interfirm operational relationships. Hence, based on propositions one through four, and based on the arguments made above, I posit that the SDNM capability and practices can positively support SE.

Proposition 5: SDNO and SDNM practices can play a positive and essential role in facilitating SE.

Now that SDNM's role in SE has been established, the next section will inspect this relationship within the organizational boundary perspective.

6.8 SDNM, SE, and Organizational Boundaries

Determining the organizational boundaries of a new start-up entrepreneurial firm can determine the chances of success and survival of the new start-up (Jacobides & Winter, 2007). Often, new small entrepreneurial ventures lack all the resources necessary to bring their products to the end customer. So, they enter into strategic relationships with established firms to access their financial, manufacturing, distribution and other capabilities (Alvarez & Barney, 2001). Moreover, entrepreneurial firms seek the legitimacy that comes with a strategic relationship with an established firm(s) (Alvarez & Barney, 2001; Cooper, 2002). However, large firms can end up absorbing the new technology developed by the entrepreneurial firm and threaten the very survival of the new start-up (Alvarez & Barney, 2001). Therefore, the organizational boundary decision is not only important for competitive advantage reasons, as is the case for

established firms, but it is in fact very critical for the survival and growth chances of small entrepreneurial firms also (Baum, Calabrese, & Silverman, 2000).

Multiple perspectives can be used to understand organizational boundaries (Araujo et al., 2003; Argyres, 1996). For example, Santos and Eisenhardt's (2005) conceptualize four concepts of boundaries[1]: boundaries of efficiency (minimum cost boundaries, i.e., TCT), boundaries of power ('maximum power over critical dependencies'), boundaries of identity (boundaries set to create consistency between actions and identity), and boundaries of competence ('maximize opportunity value of resource portfolio') (Santos & Eisenhardt, 2005). The boundaries of competence concept, which uses RBV as a theoretical underpinning, perceives the firm as a "bundle of unique resources" (Santos, Eisenhardt, 2005: 497) that are dynamic and changing as the firm pursues market opportunities. The SCM field, being a boundary spanning capability that strives to coordinate interfirm relationships that are established to access network resources and capabilities, fits the RBV of organizational boundaries (Argyres, 1996; Barney, 1999).

According to the competence view, the optimal boundaries of a firm are determined by the resource portfolio structure that enables the firm to exploit market opportunities, i.e. entrepreneurial opportunities. Additionally, this view focuses on growth, coevolves resources' configurations with market opportunities to drive the vertical and horizontal boundaries, and manages the boundaries through dynamic

[1] Plural term "boundaries" is used instead of singular boundary because firms are usually involved in multiple businesses and/or offer multiple products and thus will rarely have the exact boundary in every product or business.

internal capabilities such as product development and 'patching' and external dynamic capabilities such as alliances, acquisitions and divestitures (Eisenhardt & Brown, 1999; Eisenhardt & Galunic, 2000; Eisenhardt & Martin, 2000; Santos & Eisenhardt, 2005). Without a doubt, the different boundary conceptualizations can and should be used together as complements when determining the boundaries of the firm but when resources are "very similar or different, when the boundary choice has strategic implications, and in dynamic environments where efficiency may be less germane" (Santos and Eisenhardt, 2005: 499), the competence view is more pertinent.

All of the above characteristics of the boundaries of competence indicate its relevance to SE and thus further support the view held by many that SE fits best with the RBV of competitive advantage. According to this view then, a resource that can, when complemented with internal resources, create a VRIN capability configuration for exploitation and exploration purposes should be sought through acquisition or alliance. On the other hand, a resource or a process that is deemed obsolete is divested in order to maintain flexibility and focus on core competence (Leonard-Barton, 1992; Shimizu & Hitt, 2004; Shimizu & Hitt, 2005). Furthermore, SDNM (SCM) has been shown in this dissertation and in the literature to ascribe to the RBV (Rungtusanatham et al., 2003). Thus, I've proposed in this work that the SDNM (SCM) capability can play a significant positive role in pursuing SE. Next, an attempt will be made to shed light on the positive role SDNM capability, as a source of tacit knowledge regarding the network, can play in boundary decisions that match SE requirements.

In environments of rapid change where simultaneous entrepreneurial (exploration) and strategic (exploitation) actions are critical (Alvarez & Barney, 2007; Foss et al., 2007; Langlois, 2007), the competence conceptualization views the firm boundaries as determined by the competencies (resources and capabilities) a firm owns. And because processes making up the value chains span firm boundaries, it is not enough for the firm to know its own operational capabilities (competences) but the firm should also understand the complementarity between interdependent processes throughout the value network. This will not only be critical in effectively exploiting network resources and capabilities but it can also support explorative activities, which due to their uncertain outcome nature heavily depend on relational capital and trust.

Additionally, interdependencies, complementarities, and integration of value chain processes depend greatly on tacit knowledge to identify opportunities and unique configurations. The idiosyncratic nature of tacit know-how can create causal ambiguity on how resources and capabilities lead to competitive advantage and thus grant the firm a more durable competitive advantage (Barney, 1991; Berman, Down, & Hill, 2002; Kogut & Zander, 1992; Teece et al., 1997). Many have tried to copy Toyota and Wal-Mart supply chain management efforts but have failed because they would and could only imitate what was explicit and not the tacit elements involved in managing the supply chain.

Also, tacit knowledge is deeply embedded in socially complex settings and through shared experiences the "stock of tacit knowledge is accumulated over time" (Berman et al., 2002: 27). Hence, tacit knowledge will require relational capital which

can be created through repeated collaborative interactions (relational capabilities) (Collins & Hitt, 2006). Unique exploitation and exploration opportunities can be found in collaboration efforts that cross divisional boundaries to jointly develop new products in a multibusiness firm (Kleinbaum & Tushman, 2007). Based on that, one can easily deduce that even more opportunities for incremental and radical innovation can be found through collaboration efforts that cross organizational boundaries (Ketchen et al., 2007; Simsek, Lubatkin, & Floyd, 2003).

Due to the outcome uncertainty usually associated with the launch of entrepreneurial ventures, cognitive incongruence and/or cognitive incompleteness regarding the entrepreneur's "means-ends" framework can prevent value chain members (i.e. suppliers) from going along with the innovative idea; which leads to internationalization of stages (Zander, 2007). This is especially important for new entrepreneurial firms where the new firm usually faces not only financial constraints but also competency constraints. In the case of established firms, past interactions, relational capital, social capital, knowledge absorptive capacity and trust become paramount under such conditions (Nooteboom, Berger, & Noorderhaven, 1997; Richmond et al., 1998). What is more, SRM processes of establishing strategic partnerships, of collaborating on design of products and processes, and of reducing the supply base size can promote trust (Carney, 1998; Cullen et al., 2000; Das & Teng, 1998; Handfield & Bechtel, 2002; Zaheer, McEvily, & Perrone, 1998; Zaheer & Venkatraman, 1995), create relational capital (Dyer, 1996a; Dyer, 1996b; Dyer, 2000; Dyer et al., 1998; Dyer & Singh, 1998), create social capital and embeddedness (Uzzi,

1997) between the partners. This in turn will further encourage partners to invest in relation-specific assets and share tacit knowledge which are often necessary for entrepreneurial ventures.

Thus, the SRM capability can provide valuable input for SE-based boundary decisions as it is capable of identifying incremental innovation opportunities and closely working with the suppliers to exploit complementarities. On the other hand, it can also support exploration entrepreneurship because SRM practices promote long-term partnerships, and stimulate and support the sharing of tacit knowledge through joint problem solving and product and process design collaboration with the reduced base strategic suppliers. SRM capability, through active pursuit of relational and social capital creation, can create tacit knowledge regarding suppliers' operational capabilities (Collins & Hitt, 2006). Thus, in addition to brining suppliers along to invest an entrepreneurial project, SRM can help determine whether a firm pursuing SE should internalize a value chain stage, acquire, or establish a strategic outsourcing relationship based on suppliers' capabilities.

Network ties can provide market knowledge that help develop the appropriate competitive capabilities (McEvily & Marcus, 2005). CRM capability actively manages the downstream network ties and help accumulates tacit knowledge regarding customer operational capabilities and how the firm can best exploit opportunities with the customer. Based on that tacit knowledge, which is developed over time through repeated collaborative interactions, a firm will be, through weaker ties available by structural embeddedness, capable of looking beyond the intermediate customer through

to identify end market entrepreneurial opportunities (Burt, 1992; Granovetter, 1985). It can also help the firm better evaluate its boundaries of competence and its resource portfolio structure. Moreover, if a customer is deemed not to possess the capabilities required to exploit entrepreneurial opportunities, the firm can decide to move into the downstream stage or search for a customer that can use the firm's capabilities so that it can more effectively exploit its current competitive advantages. Thus, CRM can provide valuable knowledge and understanding of downstream operations which the firm can use as it evaluates its boundaries continuously to support SE.

ISCM in turn focuses on the seamlessness of internal operations and their ability to implement business strategy. Thus, through the integrative approach it can provide a holistic view of the internal competences and how they fit with the suppliers and customers. Understanding internal operational interdependencies can help identify incremental and radical improvement opportunities which will lead to more effective identification of resource gaps and thus better boundaries of competence evaluation (Santos & Eisenhardt, 2005; Sirmon et al., 2007; Teng, 2007). As ISCM brings people from different functions together on continuous basis to work jointly on system optimization projects, it will help, through shared experiences, create relational capital and tacit knowledge that can help the group provide valuable input on boundary decisions. This understanding of internal core competencies will enable the firm better integrate with its suppliers and better serve its customers (Takeishi, 2001).

By integrating CRM, SRM, and ISCM together SDNM practices strive to integrate knowledge of internal competencies with knowledge of customers' and

suppliers' processes. Consequently, these integrative processes will create tacit knowledge of the idiosyncrasies related to managing customers, suppliers, new product and development projects which can be used to more effectively determine whether to bring an operation in or disintegrate it. Active SDNM also has trust and relational capital effects which can also play a role in strategic outsourcing decisions as firms who have established an embedded relationship with strategic suppliers will feel less burdened by transaction cost factors when deciding to outsource more processes to the same suppliers.

Therefore, SDNM capabilities are not only important for more effective and efficient exploration and exploitation activities but also the tacit knowledge of the internal operations and how they fit with the network operations can also positively support an SE based boundary decisions. Undeniably, procurement, distribution, manufacturing, and product development processes will have an effect on a firms ability to pursue SE. Since the inception of SCM, the focus has been on exploiting improvement opportunities with regards to transportation, inventory, facilities, manufacturing set ups, and other operational measures. However, recent SCM research is more interested in exploring opportunities and have come to accept the supply chain (network) as a complex adaptive system while also being cognizant of the structural embeddedness that exists throughout the demand network (Choi et al., 2001; Choi & Kim, 2008). Hence, SDNM can built on its previous focus on operational integration and the relational capital it has build on the operational level to focus on the soft side of the relationship to actively explore for entrepreneurial opportunities. This will enable

better boundary decisions and hopefully avoid failures of strategic alliances, mergers and acquisitions between firms that look like a perfect match for each other operationally.

Although Insigna and Werle (2000) emphasize that outsourcing decisions should not be solely made on the operational level because the strategic intent is lost in the day-to-day business problems, SDNM can connect the day-to-day operations to the strategic intent, i.e. SE. Hence, after explaining how SDNM capability can support the strategic management of resources, and how it can play a positive role in innovation processes, and based on the above, I believe SDNM can enrich the firm's tacit knowledge of the idiosyncrasies that exist within the firm and within its relationships with its customers and suppliers to make a more effective boundary decision which is more relevant to SE. So, the fields of strategy, entrepreneurship and their integration embodied by SE should take note of SCM (SDNM) practices for more than a management fad. The strategy field should perceive SCM as a business strategy and as a mean for managing arrangement of competencies (value chain) in order to maximize profits (Hamel & Prahalad, 1996; Otto & Kotzab, 2003), whether through exploitation activities (historically) or exploration activities.

Proposition 5: SDNM capabilities can enable a more effective 'boundaries of competence' decision to support SE.

6.9 Concluding Remarks

As strategy field and the RBV proponents point to the strategic management of resources as the mechanism through which VRIN capabilities create competitive advantages, the SCM field broadens in scope from an operational competency to a

business strategy that integrates competencies throughout the network. SDNM decisions span strategic (e.g. strategic network optimization, strategic partnerships), tactical (e.g. sourcing, inventory) and operational (e.g. daily production, inbound and outbound operations) activity levels. Therefore, SDNM has clear implications for the realization of many strategic objectives. SE in particular greatly depends on integrating and managing the different parties involved in the innovation process, which often requires the aggregation of different independent knowledge and capability sources (Grant & Baden-Fuller, 2004; Kogut, 2000).

External networks is a domain shared by both strategic management and entrepreneurship because both competitive advantage and innovation depend on integrating networks resources and capabilities, especially know-how, to develop complex innovative products (Gerwin, 2004), to create a sustainable competitive advantage (Grant, 1996a). The SCM (SDNM) field by definition has come about to manage the demand network interdependencies in order to realize the benefits of one vertical firm without any of the negatives of the large bureaucratic and rigid organization. Historically, SCM was concerned with operational performance measures such as cost and quality but its focus and emphasis has broadened to strategy implementation and value creation (Christopher, 2005). Therefore, the focus in this chapter has been on elaborating on the synergy opportunities that can be seized by integrating the SE and SDNM constructs.

A SE perspective of organizational boundaries requires a dynamic view of the organization where resources and capabilities are developed and protected but are also

challenged and the strategic objectives are constantly 'reexamined' (Covin & Slevin, 2002). In fact, the abilities to reverse ineffective strategic decision and/or to abandon much cherished jewel capabilities in a timely manner are critical to creating strategic flexibility (Shimizu & Hitt, 2004; Shimizu & Hitt, 2005). "Prudent firms should uncouple their integrated linkages in a timely fashion – before other firms reach similar conclusions about the merits of integration – to dispose of their assets in a healthy market" (Harrigan, 1986: 554). In order to create strategic flexibility Shimizu and Hitt (2004) provide six recommendations, among which are promoting the devil's advocate approach and creating dynamic mechanisms to gain new ideas from outside the firm, all of which are related to the SE and SDNM constructs. Hence together they can play a role in determining the boundary that provides the desired flexibility.

This dynamic nature of firm boundaries has been increasingly accepted because of the proliferation of the network organization as a source of growth (Lorange & Chakravarthy, 2002). The network organization realizes the importance of being connected to the customer through multiple points rather than through one unit (i.e. purchasing) to allow for, and exploit what is called co-creation of value with the customers (Payne et al., 2008; Prahalad & Ramaswamy, 2002, 2004a, 2004b). Therefore, CRM, ISCM and SRM teams under the SDNM function should be made up of members from all functions involved in fulfilling the customer's order.

In order to prevent atrophy and disconnect, firms need to be connected (in varying degrees) not only to customers but also to suppliers and the extended networks they are embedded in to access diverse knowledge of the new market opportunities or

technologies (Burt, 1992; Granovetter, 1985). The network organization facilitates 'self-renewal': "the ability to discover new opportunities and to continuously build new competencies" (Lorange and Chakravarthy, 2002: 645), by leveraging complementary know-how efficiently and effectively from various internal and external sources to prevent and eliminate duplication of resources and knowledge. Thus, the SDNM capability provides the means to manage the customers and to discern the knowledge gained from external networks. The knowledge gained can be integrated through operational and strategic levels to enable a superior boundaries evaluation and thus lead to boundaries that match the competitive priorities.

These characteristics and abilities are required in order to create the flexible, nimble and entrepreneurial firm capable of pursuing SE, a requirement for being competitive in today's fast paced environment (Casson & Godley, 2007; Galambos, 2005). In fast paced industries, the large bureaucratic corporation is no longer appropriate as they were during the 1900s (Chandler, 1977); instead, in this fierce global competition, successful multinational enterprises (MNEs) often delegate innovation and entrepreneurship responsibilities to local subsidiaries in order to exploit opportunities and promote proactive entrepreneurship (Birkinshaw & Hood, 2001; Prahalad & Doz, 1987), while also extending local innovations, when useful, to other local markets and adding to the firm's central (and network) knowledge-base (Zahra & Covin, 1995).

SDNM practices can facilitate local entrepreneurship and the extension of innovations throughout the strategic demand network as can been seen in Toyota's (a company known for active SDNM) success in replicating effective supplier management

in different markets. SDNM can also, through active relationship management, promote the creation of clan-based entrepreneurship where trust plays a critical role in governing under uncertainty (Alvarez & Barney, 2005). Undeniably, under SE, resources and capabilities and their owners need to be mobilized and coordinated in a synchronized manner according to the organization form conceived by the entrepreneur (Witt, 2007); all of which are core objectives of the SDNM capability also.

From the above concepts we can conclude that determining the organizational boundaries for an entrepreneurial firm is a complex process which involves a great deal of tacit knowledge due to the knowledge-based nature of innovation and entrepreneurship. Tacit knowledge that rests within the individuals who span the boundaries and manage the interrelationships between the different strategic demand network members who own the resources and capabilities required for SE. The SDNM capability endeavors to create and accentuate the synergistic relationships among the different functions within the firm and among the strategic network partners in order to deliver the right product to the right customer in the right quantity and at the right time (Vakharia, 2002), and this capability is even more paramount for SE where innovations become obsolete and/or imitated relatively fast.

Therefore, in this work an effort was made to identify the pertinence of SCM and the concept of SDNM in particular to the SE construct. The direct relationship between the SDNM capability and the strategic management of resources dimension of the SE was elaborated, especially within the external networks domain of SE. As periods of competitive advantage enjoyed by successful firms become ever shorter (Fine &

Whitney, 1996; Fine, 1998), it is important for the firms to understand the dynamic nature of their boundaries and competencies. Therefore, pursuing SE is extremely important in order to obtain and enjoy successive competitive advantages using different competencies, which may demand different firm and network structures (i.e. supply chain designs) (Fine, 1998). This dynamic posture will enable the firm to maneuver in the hypercompetitive environment and facilitate agility, flexibility, speed and innovation (Bettis & Hitt, 1995; D'Aveni, 1994; Hamel & Prahalad, 1994; Meyer & Heppard, 2000). These firm dimensions require a substantial amount of alignment between the different units (internal and external) and demand coordinated and synchronized strategic actions that span multiple units within the firm and through the external network (Lee, 2004). All of which, the SDNM capability and the SCM field have been keen to address in the extant SCM research.

Also, SDNM helps SE by developing demand network agility by proactively working to promote information sharing, develop collaborative partnerships among network members, design for postponement and hold generic inventory buffers, develop a reliable logistics system, and have contingency plans (Lee, 2004). It also develops adaptability within the demand network by monitoring and sensing the global markets for suppliers and customers, understand the end customer's and the immediate customer's needs, design products for flexibility, and understand emerging technologies that have an effect on the firm's product life cycle (Lee, 2004). The methods implemented to develop agility and adaptability in addition to knowledge sharing among the network members, clarifying roles and tasks of the members, and equitably sharing

risks, costs and gains lead to the alignment of the objectives of the strategic demand network members (Lee, 2004; Narayanan & Raman, 2004). The uncertainty surrounding exploration activities make network alignment more salient. Certainly, the objectives of agility, adaptability and alignment are critical for the new competitive environments characterized by risk, uncertainty, and fierce global competition (Bettis & Hitt, 1995), where competitive advantage requires SE by the entire demand network in order to exploit current competitive advantages and explore future opportunities and create value.

This chapter elaborated on the potential for synergy that can be realized by integrating the SE and the SDNM capability and practices. Specifically, with RBV as an underpinning, the SDNM capability was proposed to provide more effective strategic management of resources within the firm and throughout the network to successfully bring about innovation. This can in turn support strategic entrepreneurship and boundary decisions based on SE objectives. SDNM's emphasis on connectivity, collaboration, synchronization, leverage, and scalability (duplicability with other partners) (LaLonde, 2003) can help create the quick, agile, and flexible network (LaLonde, 1997) necessary for producing strategic entrepreneurship and its demand for a speedy, coordinated and synchronized management of the resources and capabilities within the network.

Moreover, SDNM with its emphasis on creating relational capital can positively help a firm pursuing SE to determine the best firm and network boundaries given its resource endowment and competitive environment. It can also provide valuable input on

which value chain stages to be integrated and which to be outsourced and whether a merger with and/or acquisition of a firm owning a desired resource is the right decision. Because SDNM processes are directly involved in holistically managing the processes that span organizational boundaries (Pathak et al., 2007), they can build a wealth of tacit knowledge on the interdependencies and integration which can better evaluate an integration decision.

Therefore, I believe that the SDNM capability can be highly valuable for firms pursuing SE and it is imperative for the strategy field to understand and integrate knowledge from the SCM field and utilize the SDNM capabilities to realize the strategic objectives posited by RBV theory and others to achieve competitive advantages. On the other hand, as SDNM manages the oscillation between integral and modular demand network (supply chain) structures (Fine & Whitney, 1996; Fine, 1998, 2000), it is important that the SDNM integrates knowledge from the strategic management in order for a firm to effectively structure, manage and leverage the demand network to match the competitive environment and attain competitive advantage. In other words, for firms pursuing SE, SDNM provides valuable tools for exploitation activities and can also provide support for exploration activities that heavily depend on network ties and knowledge transfer.

In a 2007 special issue of the Journal of Management Studies, scholars of both entrepreneurship and the theory of the firm explore different ways through which entrepreneurial opportunities can be exploited and provide their inputs on the conditions that make organizing a firm the most efficient mean for exploiting a factor or product

market imperfection (Alvarez & Barney, 2007). Arm's-length transaction, alliance, and or hierarchical governance are all different means of accessing all the resources necessary to exploit an entrepreneurial opportunity. Theory of the firm literature based on TCT often attribute the governance decision to the risks of opportunism (Williamson, 1985) which according to Alvarez and Barney (2004) and others can be known probabilistically. However, "entrepreneurial settings can be described as uncertain" (Alvarez and Barney, 2007: 1059) making the firm unable to probabilistically predict the outcomes of economic actions. Therefore, the ability to effectively manage resources in an uncertain environment will be critical for determining the most suitable organizational form of the entrepreneurial firm (Foss et al., 2007).

Resources and capabilities, coordination requirements, and strategic control and risks are all factors that influence the vertical integration decision (Hayes et al., 2005). And under the new competitive landscape time constraints prevent a firm from developing unique capabilities internally because they require early investments and building them through a path-dependent and time consuming learning process (Linder, 2004). As a result, firms resort to strategic outsourcing where the buyer relies on the intermediate market to provide knowledge-based specialized capabilities that complement and supplement internal core capabilities (Holcomb & Hitt, 2007; Quinn, 1999). Due to its objective of exploiting complementary specialized capabilities to create synergy, effective strategic outsourcing results not only in cost economies but also creates economic value (Fine & Whitney, 1996; Holcomb & Hitt, 2007).

On the other hand, the objectives of strategically managing resources and innovation processes in a manner that balances exploration and exploitation objectives can also lead to a more effective SDNM capability. SDNM's focus on efficiency exploitation when exploration activities are needed will create a mismatch between strategic objectives and operational capabilities. Therefore, when the firm's SDNM practices are guided by SE, and SE based boundary decisions, CRM, ISCM and SRM activities will be designed and used accordingly to align interests throughout the network (Lee, 2004; Narayanan & Raman, 2004). Thus, SDNM practices will be advertent to exploit improvement opportunities whether incremental or radical. They will also help create the relational capital needed to share tacit knowledge required to effectively support SE. Utilizing strategic objectives to guide SDNM practices also provides the theoretical and strategic underpinning for SDNM practices and how they implement strategies. Such an orientation will guide the firm's demand network structure and whether the network structured is lean or agile for example (Christopher, 2000; Christopher & Towill, 2001; Christopher & Towill, 2000; Christopher & Towill, 2002).

In conclusion, more fine tuned integration between the strategy and SDNM fields is needed to answer the criticisms directed towards each field. In this work, an attempt was made to explore how SDNM practices relate to SE through their direct relationship with the SE dimensions of managing resources strategically and innovation. Together, they were posited to facilitate SE and a more effective boundary decision to support SE.

CHAPTER VII

CONCLUSION

7.1 Summary

As the concept of SCM gains popularity and prominence, its focus and objective have broaden from mere production, inventory and logistics coordination to a more strategic pursuit of supply chain agility, adaptability, and alignment (Lee, 2004). Moreover, supply networks are increasingly being recognized as complex adaptive systems that must balance the sometimes contradictory objectives of control and natural emergence (Choi et al., 2001). The new competitive landscape demands dynamic supply chain structures so that no permanent memberships are assumed and businesses are allowed to 'coevolve' and integrate autonomously in order to seize opportunities (Eisenhardt & Brown, 1999; Eisenhardt & Galunic, 2000). In the same vein, the SCM field is also becoming more cognizant of structural embeddedness, which calls for understanding that the suppliers and customers as embedded in larger networks of suppliers and customers, respectively, than operating in isolation, when designing and managing supply chains (Choi & Kim, 2008). Although a firm can't efficiently or effectively manage every supplier within the chain, especially those at longer distances, it must however manage relationships with those that are within its managerial purview (Choi & Krause, 2006).

Furthermore, in recent years, theories from the strategy field are being extensively used to provide theoretical underpinnings for the SCM field, which has often

been criticized for lacking theory. Following the same objective, and in response to recent calls for bridging organization theory and SCM (Cheng & Grimm, 2006; Ketchen & Hult, 2007b, 2007a; Miles & Snow, 2007), this research effort was instigated. Indeed, through exposure to both fields, one can observe reciprocity between the two areas and great integration opportunities. Of particular interest to this work are the strategic management concepts of dynamic capabilities, alliances management capability and strategic entrepreneurship. All of which are competitive strategies for attaining and sustaining competitive advantage in the new competitive landscape.

Although many theories from the strategy field have relevance to the SCM research, the RBV seems to be the most popular among SCM researchers and the concepts chosen for this work are often considered extensions of RBV and/or KBV. Moreover, these concepts are extremely significant in the fast-paced and knowledge-intensive business environment that demands flexibility and innovation, where 'self-sufficiency' is often not a viable option for competitive advantage (Inkpen, 1996). And firms need to rely on partners for specialized resources, capabilities and knowledge. Thus, the competition has shifted to networks versus networks instead of firm versus firm and the ability to manage the network has become critical (Baum et al., 2000; Christopher, 1998; Dyer, 2000; Gulati, 1998; Gulati et al., 2000; Jarillo, 1988; Lorange & Chakravarthy, 2002; Miles et al., 2005).

Traditionally, SCM was viewed as a process for moving products throughout the value chain to support a single competitive priority. However, strategic supply chain management is viewed as a strategic weapon that builds agile, adaptable, and aligned

supply chains to create total value including speed, cost, quality and flexibility competitive priorities (Ketchen & Hult, 2007b). Therefore, SCM is concerned with managing all activities involved in integrating supply and demand management within and across companies composing the supply chain (CSCMP, 2009). They include sourcing and procurement, conversion, manufacturing, logistics, and coordination and collaboration activities. As such, SCM has significant implications for network-based competitive advantage strategies. Therefore, in CHAPTER III a set of SCM practices were chosen and elaborated on. These practices: SRM, CRM, ISCM, together constitute the SDNM (SCM) capability. Also, the term SDNM (strategic demand network management) is advocated in this work in place of SCM to better reflect what SCM represents. Then, these practices are integrated with strategic management concepts of dynamic capabilities, alliance management capability and strategic entrepreneurship and the processes associated with them.

Dynamic capabilities are suggested to directly or indirectly create competitive advantage in uncertain, fast-paced business environments (Eisenhardt & Martin, 2000; Helfat, 1997; Helfat et al., 2007; Teece, 2007; Teece et al., 1997; Wang & Ahmed, 2007; Zahra et al., 2006). They are posited as an extension of the RBV and they represent the firm's ability to identity unique configurations of competences that lay inside and/or outside the firm, the ability to integrate these competences, and the ability to ultimately reconfigure these competences in innovative ways to renew operational competencies that match environmental contingencies (Eisenhardt & Martin, 2000; Helfat et al., 2007; Pavlou, 2004; Teece et al., 2002; Teece & Pisano, 1994; Teece et al., 1997; Zahra et al.,

2006). Furthermore, Pavlou and Sawy (2006) decompose dynamic capabilities into sensing, learning, coordinating, and integrating processes, which they refer to as enabling processes, and a reconfiguring resources goal process. Teece (2007) also disaggregates dynamic capabilities into sensing and learning abilities, opportunity seizing abilities, and the ability to combine, protect, and reconfigure tangible and intangible resources.

Realizing that a firm's dynamic capabilities should extend beyond the firm boundaries to encompass demand network members, in CHAPER IV, SDNM practices and the dynamic capabilities processes were integrated. Sensing and learning processes were integrated with the SDNM practices to explicate SDNM's role in enabling the holistic view of the network. This holistic view of the network interdependencies is important for a sensing ability that strives to understand the environment, to identify market needs and opportunities, and to identify upstream technological changes. The learning process is also affected by SDNM practices through SDNM's emphasis on active management of the relationship that is more conducive to knowledge transfer and knowledge building. Hence, SDNM is posited as having a positive effect on the sensing and learning processes of the dynamic capabilities.

Similarly, the coordination, integration and reconfiguration processes were integrated with the SDNM practices to show SDNM's facilitating role in each. On the other hand, the merits of considering SDNM as a dynamic capability were considered. Verily, the SDNM capability can be used more effectively as a strategic weapon if SDNM practices were designed and developed as dynamic capabilities processes,

including sensing, learning, coordinating, integrating and reconfiguring processes. Speed in applying dynamic capabilities to create competitive resource combinations capable of producing goods and services that deliver superior value to customers sooner and more astutely than competitors determines their contribution as a source of competitive advantage (Eisenhardt & Martin, 2000; Wang & Ahmed, 2007). Thus, SDNM capability is posited in this work as an enabler of dynamic capabilities. Examples of dynamic capabilities are: strategic decision making, product development, and alliance management (Eisenhardt & Martin, 2000).

Building on the preceding chapter, CHAPTER V explores the integration of the alliance management capability from the strategic management research and the SDNM capability based on the SCM research. Need for external know-how arises because as products become increasingly complex, many firms realize that they lack the knowledge, the resources and the capabilities to be the best in every process in the product's value chain (Clark & Fujimoto, 1991; Dyer et al., 1998; Handfield & Bechtel, 2002; Handfield & Nichols, 2002; Prahalad & Hamel, 1990). At the same time, these knowledge-based assets are often too tacit in nature to be acquired through an arm's-length transaction. Hence, firms enter into strategic alliances with external partners. However, alliances have a high failure rates and therefore the alliance management capability becomes critical for a firm seeking to exploit synergy opportunities with complementary competencies external to the firm (Kale et al., 2002). In fact, access to the specialized resources, especially tacit knowledge, is a critical reason for alliance formation (Hitt et al., 2000). That is why the extended enterprise has become popular, mainly to enable the

collaborative advantage required for the knowledge-intensive fast competitive environment (Dyer, 2000; Dyer et al., 2001).

Nonetheless, strategic alliances have significant coordination costs associated with integrating the complementary interfirm processes, costs that need to be controlled and minimized (Dyer, 1997; Gerwin, 2004; Gulati, 1998). Also, it requires a great deal of integration and coordination efforts to effectively utilize the various resources within the network (Das & Teng, 1997, 2000a; Parkhe, 1993). That is why proactively managing the alliance relationship, through an alliance management function according to some, holds great potential for lowering transaction costs, enabling effective resource exploitation and exploration, leveraging previous alliance experiences thereby leading to competitive advantage (Dyer et al., 2001; Ireland et al., 2002; Kale et al., 2002; Sarkar et al., 2001). This is especially true for vertical alliances in which firms add value to their suppliers' output until the end product is sold to the end customer (Hitt et al., 2005).

Realizing great parallels in the strategy field's strategic alliance management capability and the SDNM capability, an effort was made to integrate the two areas. This was done in hopes of using organization theory to shed more light on the still developing SDNM knowledge and guide the development of SDNM practices. Additionally, the SDNM capability is also shown as pertinent for effective alliance management capability to enable access to and integration of valuable partner resources. This process of access to valuable resources and the ability to manage and utilize this access to complementary resources in order to exploit current resources and knowledge or create new resources

and knowledge is critical to competitive advantage (Dyer & Singh, 1998; Inkpen & Dinur, 1998; Rothaermel & Deeds, 2006; Srinivasan & Brush, 2006).

Alliance management capability is considered by some as a form of dynamic capabilities because it requires a great deal of resource integration such as in product development routines between complementary alliance partners. Other resource integration examples can be seen in the alliance resource reconfiguration processes such as in the transfer, replication and allocation of resource between partners, and the resource gain and release process such as in knowledge creation and application through alliances (Eisenhardt & Martin, 2000). Therefore, Spekman and his colleagues (1998) emphasize the role of the alliance manager. They also suggest that the real challenge is in viewing the alliance as central to firm strategy and simultaneously integrating it with day-to-day operational realities of alliance management.

Based on the strategic alliance management literature from the strategy field (Dyer, 1996a; Dyer, 1996b; Dyer, 2000; Dyer & Hatch, 2006; Dyer et al., 2001; Dyer & Nobeoka, 2000; Dyer & Singh, 1998; Kale et al., 2002), the activities of creating trust and effectively managing knowledge sharing, identifying and combining complementary resources, investing in dedicated alliance assets, and effectively governing the alliance relationship constitute the alliance management capability necessary for collaborative advantage. SDNM capability's role in providing network visibility, enabling supply chain adaptation, and fostering long-term relationships can support the above activities. Moreover, the SDNM practices support the creation of relational capital and

embeddedness, which in turn help create trust and facilitate effective knowledge sharing (Dyer & Singh, 1998; Uzzi, 1997).

In addition, the SDNM capability can integrate the knowledge gained from the ISCM, SRM and CRM processes in order to identify and sometimes develop the resources and capabilities that complement those of customers and suppliers. The operational and tactical level involvement of the SDNM practices provides it with unique insight on how operational competencies complement one another. Moreover, the SDNM practices also encourage investment in dedicated assets by establishing long-term strategic partnerships with a smaller supplier base and active management of these relationships. Additionally, SDNM practices facilitate effective governance of the alliance relationships. Thus, SDNM practices enable more effective alliance management activities. On the other hand, SDNM practices can be developed and implemented more effectively when alliance management activities are taken as objectives for the SDNM practices. Indeed, the alliance management capability is critical for competitive advantage in the new competitive landscape and therefore developing the tactical SDNM capability to support alliance management capability activities would better guide the development of SDNM practices.

In CHAPTER VI, the concepts of SE and SDNM were integrated to show how SDNM can support SE and SE-based boundary decisions. Building on all the preceding chapters, arguments suggest that SDNM practices can play a positive role in the stages managing resources strategically and the innovation and entrepreneurship stages. Moreover, arguments from CHAPTER IV and CHAPTER V were also incorporated to

shed light on the positive role the SDNM practices and the SCM research can play to foster and support SE. SE requires a balance between exploration and exploitation activities and a boundary decision, i.e. supply chain design, which reflects that balance. Indeed, the SDNM practices affect and are affected by the exploitation and exploration activities, especially those that extend beyond the firm, because of their role in managing boundary spanning processes.

External networks a domain that is shared by the fields of strategic management and entrepreneurship because networks are not only critical for competitive advantage strategies but they are also critical for innovative ideas. The network spanning processes and relationships need to be proactively managed to effectively integrate and coordinate the various complementary competencies existing throughout the extended network. This active management of the interdependencies is particularly important for SE because the strategic management of resources is an important dimension of the SE construct. Moreover, the network has not only become a critical source of innovative ideas but also plays an important role in assessing the ideas, in identifying the capabilities required, and in mobilizing the capabilities to realize the innovation.

The strategic management of resources occurs through three stages: structuring, bundling, and leveraging. And in this work arguments posit that SDNM practices can enable a more effective structuring stage by providing visibility of network resources, which helps the firm better structure its and the networks resource portfolio. Similarly, SDNM practices facilitate the roles of the structuring and leverages stages. Through the SDNM practices the firm can better bundle resources that exist within the network to

create competencies needed to exploit opportunities. Also, the SDNM practices help mobilize and coordinate the complementary network competencies to exploit competitive advantage opportunities. Thus, the SDNM capability is shown to be critical for enabling the strategic management of resources, especially in the external network domain.

Furthermore, the SDNM practices can also play a positive role in the stages of the innovation process. An innovation starts with idea creation which is then assessed, and when its validity is established, resources are assembled and the idea is implemented. In the current competitive landscape, innovation and entrepreneurship is highly dependent on network partners for collaborative innovation. And, the SDNM capability can also enable collaborative innovation by playing a positive role in every innovation stage. Verily, understanding and integrating network competencies can enable a firm to better identify innovation opportunities, to more effectively assess the idea, and to more effectively assemble and implement strategies.

Therefore, through SDNM capability's role in enabling the strategic management of resources and innovation, an indirect link is established between the SDNM capability and SE. Also, the SDNM capability's pursuit of integration and coordination of network operations create relational capital and embeddedness. Thus, the SDNM capability affects a firms ability to exploit current competitive advantages while also explore future competitive advantage opportunities in the network versus network competition. Thus, the SDNM capability has direct significant implications for the firm's ability to pursue SE. Moreover, SDNM practices enable a holistic view and the management of the

network resources and capabilities. This can enable the firm to design its supply chain to suit its SE competitive strategy. By identifying and understanding network interdependencies and complementarities, SDNM practices integrate operational and strategic level boundary considerations to enable a more effective boundary decision. And this capability is even more imperative for firms pursuing SE. Hence, the SDNM capability is shown to enable more effective boundary decisions for firms pursuing SE.

7.2 Implications

Although theories from RBV are used in the SCM literature, this is the first work that explicitly integrates SCM (SDNM) with the concepts of dynamic capabilities, alliance management capability and strategic entrepreneurship from the strategy field. This is done to explore synergy opportunities between the two fields and to provide insights on how the two fields complement one another. Because the concepts above draw heavily from the RBV, the SCM field can provide mechanisms for managing the resources in an integrated manner, especially those that extend beyond firm boundaries. This helps dissipate the long standing criticism against RBV for not elaborating on exactly how resources lead to competitive advantage. On the other hand, these strategic management concepts give the SCM field the theoretical underpinning it has been long criticized for lacking. Instead of SCM being efficiency driven, it can adopt a more strategic view focused on dynamic capability or strategic entrepreneurship and mobilize its practices to realize these strategic objectives in pursuit of competitive advantage.

In a sense, SCM can be considered a dynamic capability as it identifies operational competencies throughout the supply chain, integrates and coordinates the

different competencies, and combines and/or configures them into new capabilities necessary for exploiting new market opportunities. Also, a firm needs to understand the interdependencies and complementarities that exist within the network in order to explore new opportunities while also exploit its current competitive advantages, i.e. SE. Thus, it is not a coincidence that the SCM concept has become increasingly popular in the new competitive landscape in which firms' competitive advantages heavily depend on the capabilities of the network in which the firms are embedded. Moreover, the SDNM practices and the strategic alliance management activities were also integrated in order to show how each set relates to the other.

The concepts borrowed from the strategic management field and affect a firm's ability to gain and sustain competitive advantage, indirectly or directly. Furthermore, they require managing the resources and capabilities that exist within the firm or within the network effectively. And it is here that the SCM field and the SDNM capability provides great insights on how to manage the interdependencies that exist within the network to create dynamic capabilities, to effectively manage strategic alliances and to pursue SE. SDNM is best suited to integrate the day-to-day operational competencies with the strategic level objectives. It can, on the one hand, enable the realization of the strategy objectives at operational levels, and, on the other hand, design and create operational competencies that fit strategic objectives.

The SDNM, through its close and repeated interactions with suppliers and customers can provide the best evaluation of synergy opportunities for mergers and acquisitions (M&A) or strategic outsourcing decisions. Thus, building on how the

SDNM capability can support dynamic capabilities, alliance management capability and SE, the SDNM can also support a more effective organizational boundary decision. When pursuing competitive advantage strategies, integrating with the SDNM capability will enable the firm to more effectively design its supply chains (organizational boundaries). Based on that integration, the SDNM capability will seek to design supply chain that engender both the exploitation of current competitive advantages and the exploration of future opportunities.

This is the first work that explicitly explores these relationships and hopefully it will serve as a catalyst for more research on how different operational competencies or SCM initiatives can support strategies for competitive advantage. Hopefully, this will push strategic management researchers to consider how strategies for competitive advantage can translate to SCM competencies capable of contributing to the achievement of competitive advantage. And, it is paramount for SCM researchers and practitioners to focus on competencies that lead to the realization of the competitive advantage strategies. Instead of pursuing a single competitive priority such as speed or cost, the SCM field should design and implement SCM practices that support strategies to achieve competitive advantage in the new competitive landscape, i.e. explore and exploit simultaneously.

Moreover, this work calls for the SCM field to actively evaluate the organizational boundaries by integrating operational and strategic views on the organizational boundary on a regular and continuous basis. Supply chain design is as critical for competitive advantage as product and process design (Fine, 1998, 2000;

Fisher, 1997). Therefore, the supply chain design and structure should support the competitive advantage strategies adopted by the firm. The SCM practitioner, usually the operations manager, is exposed to a barrage of new SCM initiatives on daily basis. And his span of responsibilities has become increasingly broad and complex that it is reaching the limits of his analytical capacity. This work directs the practitioner to focus on SCM practices and initiatives that support competitive advantage strategies developed in the strategic management field, strategies that match the new competitive landscape and the critical need to exploit and explore simultaneously.

7.3 Future Research

This is a conceptual work that for the first time directly links dynamic capabilities, strategic alliance management capability and SE with SDNM (SCM). It is a first step toward a more detailed analysis of the relationship between SDNM practices and the chosen concepts from the strategy field. Based on a broad literature review, synergy opportunities from integrating the two areas were identified, conceptualized, and proposed explicitly. Arguments were made for sets of propositions that in the future should be empirically investigated. Indeed, future research empirically investigating whether the process of designing and implementing SDNM practices are cognizant of these concepts, especially dynamic capabilities and SE and how this awareness shapes these practices will greatly add to the integration of two areas. Also warranted is an empirical study examining whether top executives in charge of corporate strategy use SCM to support SE or dynamic capabilities.

Furthermore, studies linking supply chain initiatives such as agile supply chains, JIT, and postponement, with competitive advantage strategies, can benefit from conclusions presented herein. Therefore, empirical testing of the propositions made in this work is a natural future research path. This research area can expand to examine different competitive advantage strategies and SCM practices in an integrative manner to identify synergy opportunities in pursuit of competitive advantage.

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VITA

Name:	Saeed Abdulla Abdulwahid Abdulla
Address:	P.O.BOX 12571 Dubai, U.A.E.
Email Address:	s.abdulla@uaeu.ac.ae, saeed.abdulla@gmail.com
Education:	B.S., Industrial Engineering, University of Toledo, 2000 M.S., Management Science, University of Miami, 2002 Ph.D., Information and Operations Management, Texas A&M University, 2009